SIEMENS

LITHOSTAR Multiline

SP

System

Installation Instructions

for Subcontractors and Siemens Technicians

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Document revision level

The document corresponds to the version/revision level effective at the time of system delivery. Revisions to hardcopy documentation are not automatically distributed.

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Items included in the Shipment

The system was prestaged, tested and programmed in the factory with all components. System start-up and the function checks required should be performed in accordance with Start-up Instructions, RXL2-120.034.01.
The system is operational once installation and start-up have been completed.

The system is shipped in the following sections:

- LITHOSTAR Multiline - basic unit.
- Generator power unit cabinet, equipped with components and boards.
- H1 HF high voltage transformer.
- Two standard cabinets.
- Control console.
- Accessories/cover panels.

Requirements

- The preinstallation work steps must have been completed in accordance with Planning Guide (PG) RXL2-120.021.01.
- Prior to the installation, the power line connection must be completed and provided with a system breaker, an emergency OFF switch, and ground fault detector as specified in the Planning Guide (PG) RXL2-120.021.01.
- The hardware for mounting the unit to the floor (Liebig expansion bolts /mounting plate) must be installed per Installation Instructions RXL2-120.038.01...
- The condition of the access route within the building, as well as the condition of the room in which the unit is to be installed, must be in compliance with the project drawings and the data listed under the ”General Installation and Conditions of Shipment - Med. Technology Division”.

Text Emphasis

- **”Cautions”** are information provided with special emphasis when there is the potential for damage to the equipment.
- **”Notices”** are information provided with special emphasis to facilitate proper use of the equipment or proper execution of a procedure.
- All texts referring to adjustments or installation steps marked with symbol” ” have to be confirmed by the subcontractor or the Siemens engineer in the installation protocol (register 3 of logbook).

Replacement of damaged or Lost Screws

- Damaged or lost screws may be replaced only with steel screws which meet the requirements of DIN 267 and must be rated in the specified hardness class.
- **All Allen screws used must be classified as hardness class 8.8.**

Safety notes

- The general safety notes for medical products must be observed in the performance of work and checks.

Yellow enameled Parts

- All parts of the unit and of components that are painted with **yellow/red** enamel are shipping brackets which may be removed only in accordance with the Installation Instructions.

Test Equipment and Tools (Service Tools Cataloque)

- Tool kit for Installation engineers
- Torque wrench (20 to 100 Nm)
- Digital Multimeter

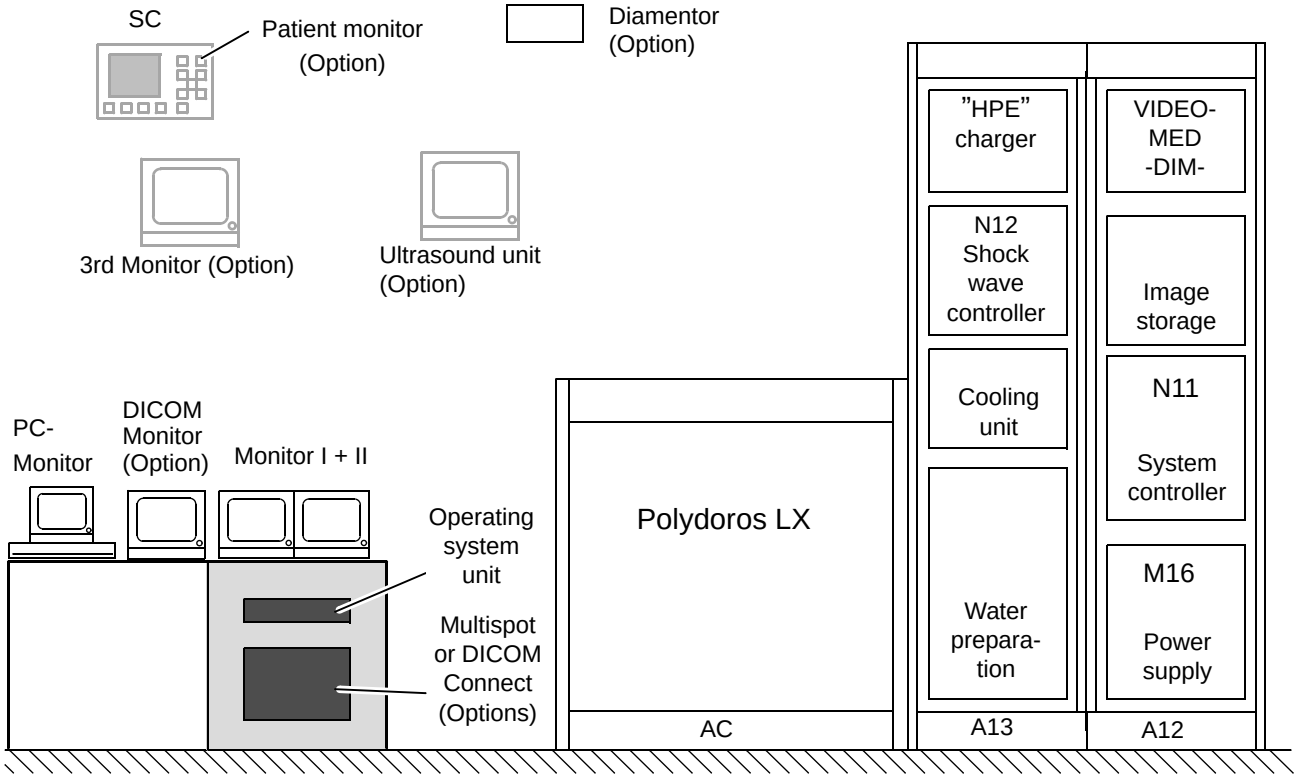
Installation auxiliary devices

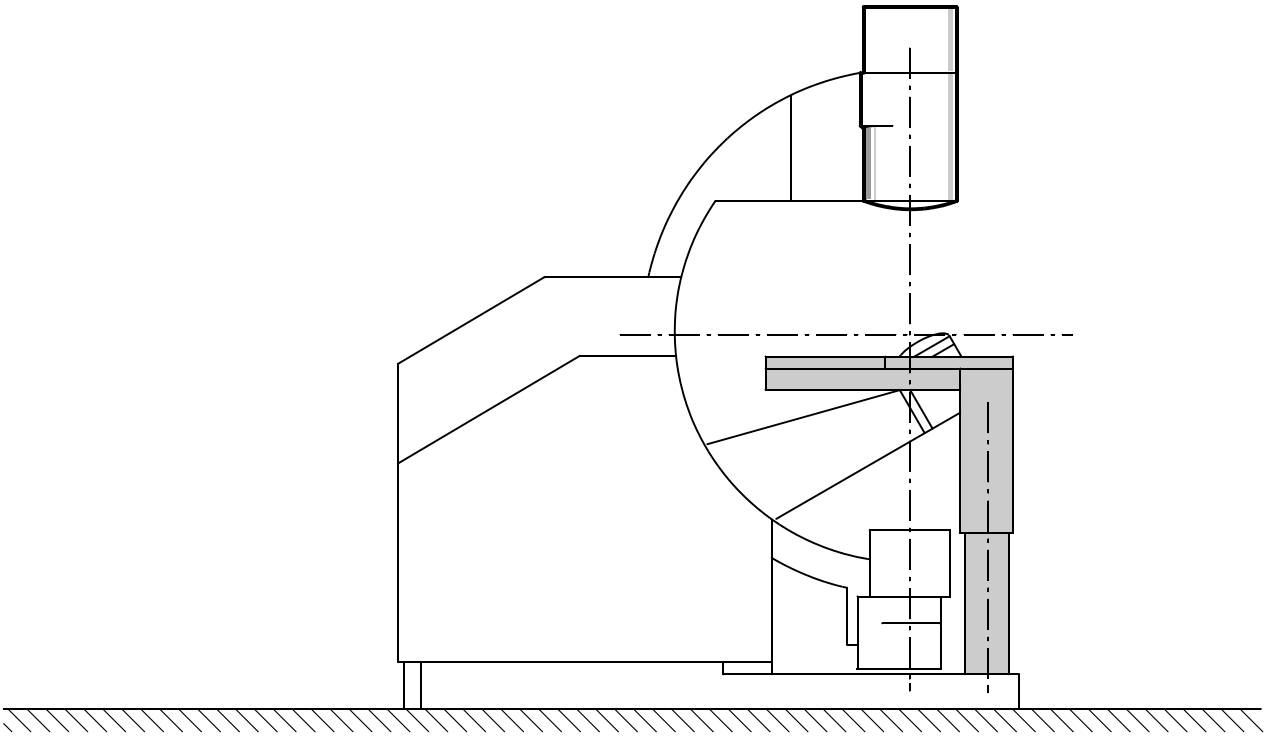
Transport carriage roller set	11 53 654 G5338 The roller set must be ordered if the system is **not installed** by the "Erlangen carrier".

Materials

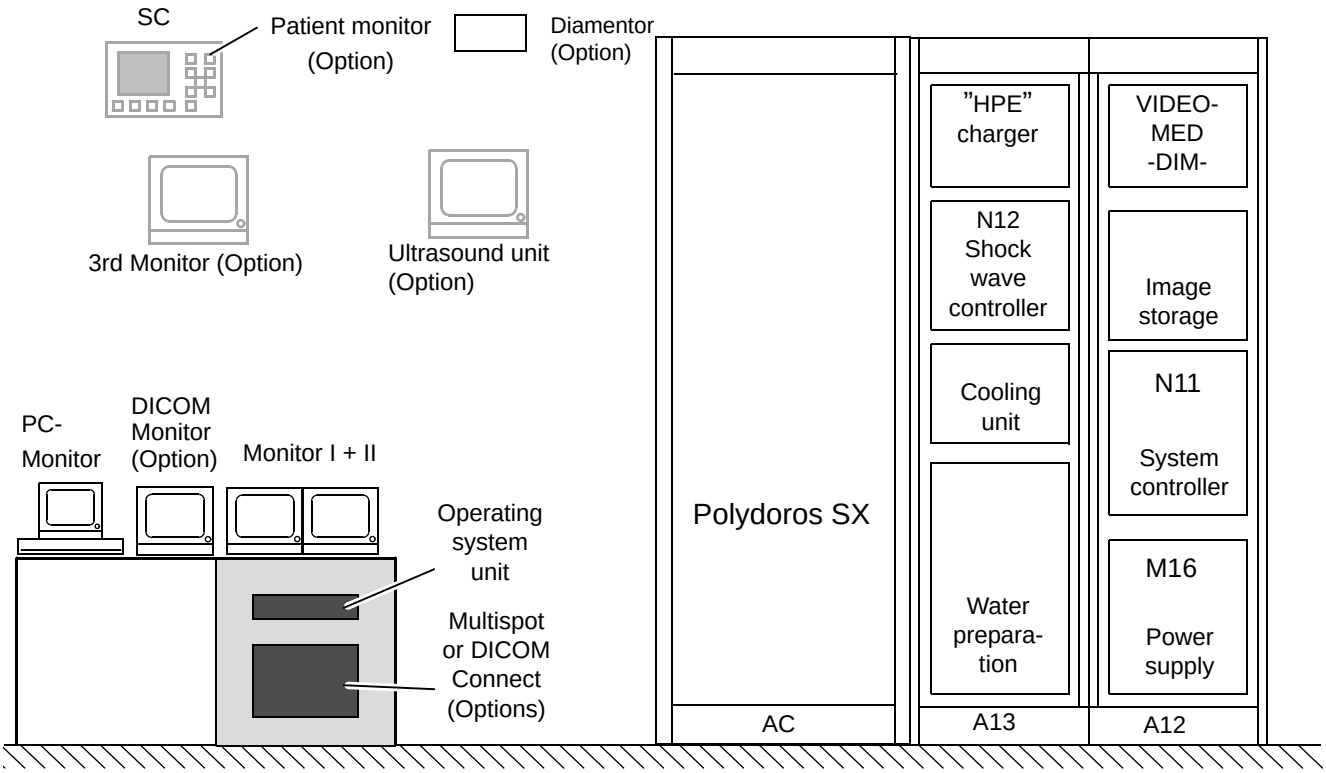
• Loctite 221	20 48 874 RV090
• Oil for high voltage transformer H1 for refilling only, if required	99 00 952

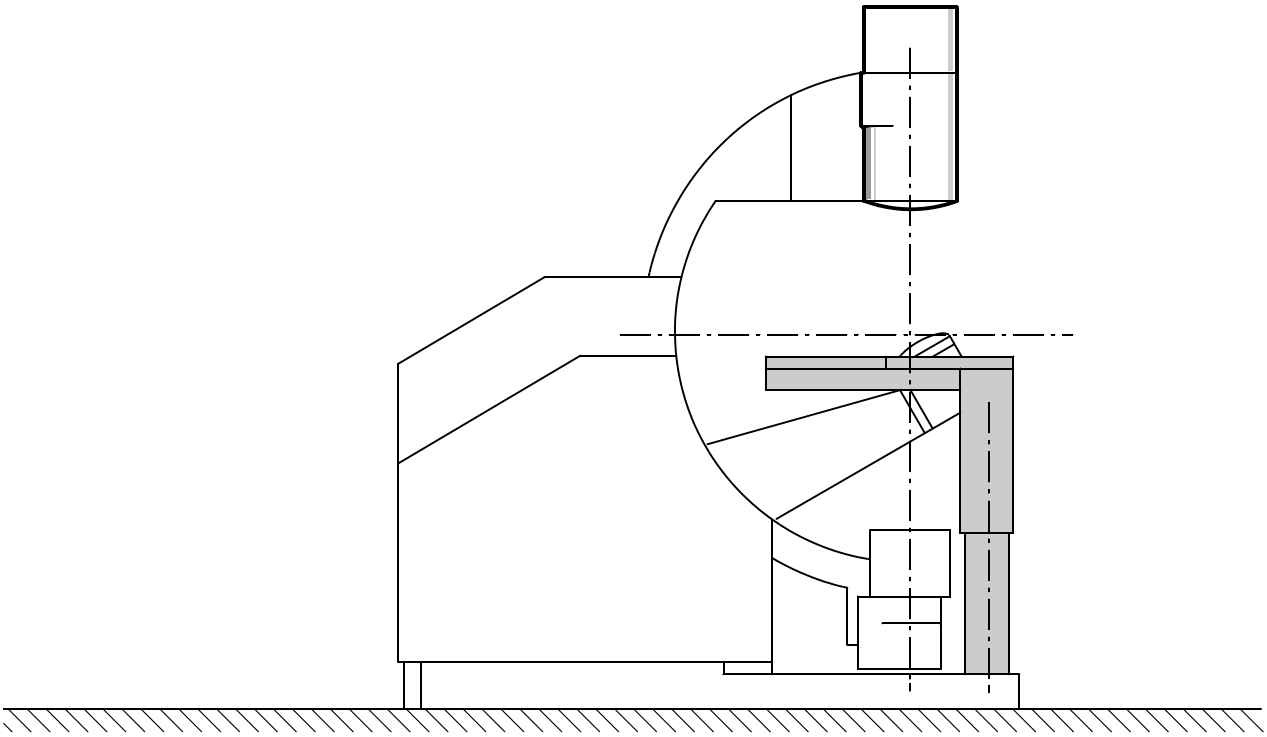
Component Overview





Component Overview





Preparation

Preinstallation work

- Check the condition of the table installation plate (floor plate).

- Check the cable feed-throughs for cabinets, system control console, and the unit for usability.

Options: Monitor trolley and/or Patient monitor

- Check the cable feed-throughs for the Patient monitor for usability.

- Make sure that there is sufficient space for a Patient monitor.

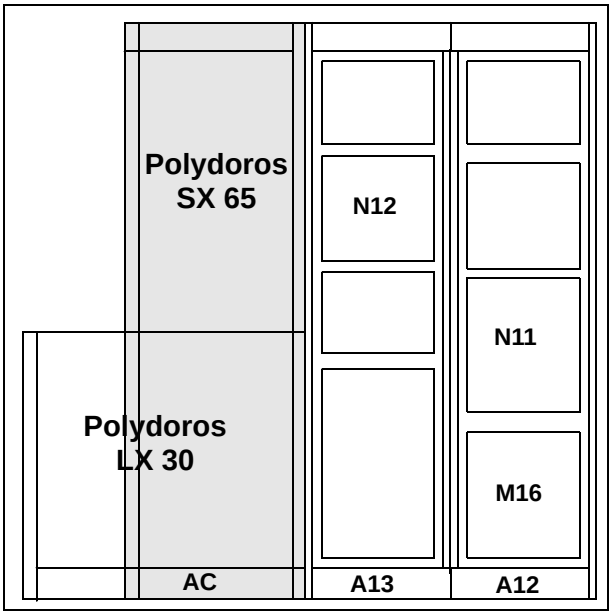


Fig. 1

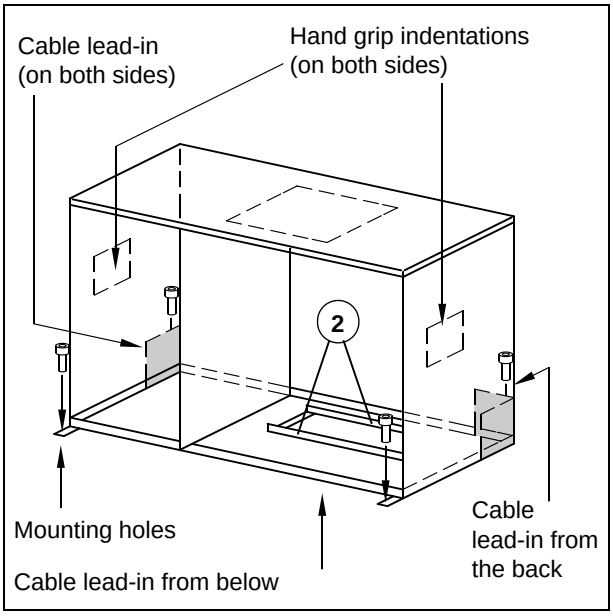


Fig. 2

Generator and Cabinet Installation

NOTICE

Do not insert the H1 high-voltage transformer until the generator is cabled in the power cabinet.

With the exception of the cooling unit and the high voltage charger, the cabinets are shipped from the factory completely assembled and are individually crated.

We recommend setting up and bolting down the generator according to the project plan or Figure 1 before installing the remaining cabinets.

Polydoros LX

- Mark on the floor and drill the four mounting holes for the generator cabinet at its intended location using the supplied template.
- Drill the holes and insert the Liebig anchors that are included in the shipment (Fig. 2).
- Remove all transport safety brackets from the generator.
- Take the generator off the pallet.
- If necessary, knock out the cable inlet in the generator cabinet for interconnections with the adjacent cabinet. Install the edge protection strip (service package).
- Mount the generator in place by inserting the 4 hex bolts into the Liebig screw anchors.

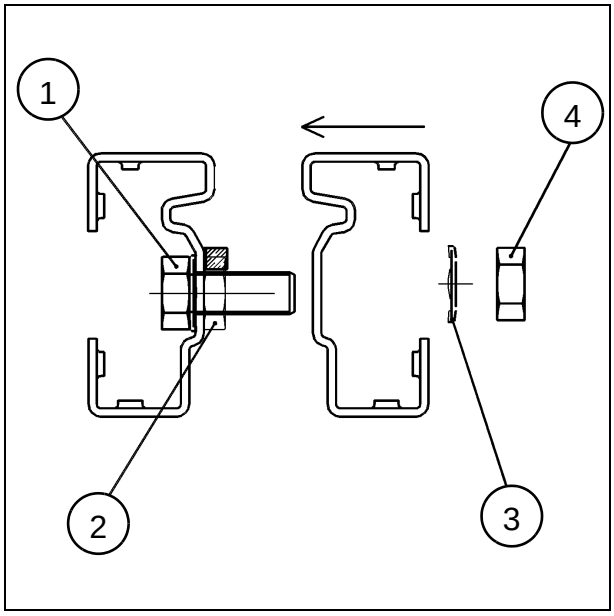


Fig. 3

Polydoros SX 65

- Move the power cabinet into its location.
- Attach the top of the cabinet to the wall with retaining brackets to prevent the cabinet from tilting.
- If required, the cabinet can also be bolted to the floor.
- If required, remove the cover for the corresponding cable inlet on the generator cabinet.
- Move cabinets A12 and A13 to their location according to the project plan or the above example (Fig. 1).
- The splash guard has to be installed between the control cabinet A 12 and the shock wave cabinet A13. If necessary, turn it around.
- Install the sidewalls of the cabinets.
- Within the scope of validity of the UL regulations (e.g. USA) the metal case should not be removed due to fire protection.
- Install the enclosed screw (1/Fig. 3) with nut (2/Fig. 3) to a cabinet to connect the cabinet. Then move the second cabinet to its position and tighten with nut (4/Fig. 3) and flat washer (3/Fig. 3).

✍ • Move the cabinets to their final position and bolt them to the wall and the floor.

Installing and Connecting the High Voltage Charger

- Unpack the charging unit, place it on the rails provided in the shock wave cabinet above the electronics unit N12 and secure it on the front using 4 screws.
- Connect the power line cable at N12 (1 on L1, 2 on N and ge/gn on PE).
- Plug in the cable from the N12, K108 to the charger controller on the charger.

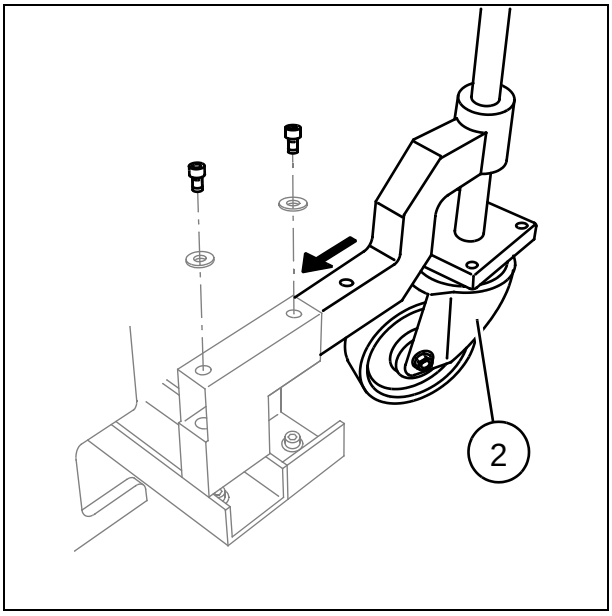


Fig. 4

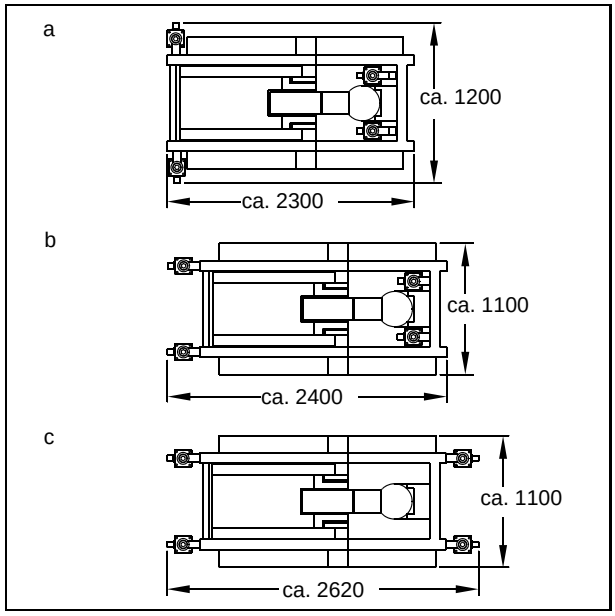


Fig. 5

Installing and Connecting the Cooling Unit

- Place the cooling system on the rails provided in the shock wave cabinet A13 (under the N12 electronics unit), slide it into position and secure it on the front using two screws.
- Insert the hoses in the appropriate connections according to marking, and ensure that they lock into position.
- Plug the power line connector for the cooling system into the socket on the electronics unit at N12.X3.
- Connect the protective conductor between the cooling system and the shock wave cabinet.

⚠CAUTION	**To avoid the risk of excessive heat build-up, make sure that the ventilation inside and outside the cabinet is always sufficient.**

Setting Up the Unit

- Place the four transport rollers (2/Fig. 4) onto the transport carriage on the yellow shipping frame at (c/Fig. 5) and bolt them in place.
- Remove the shipping pallet from the unit.
  Lift the unit with the help of the spindles and pull the transportation pallets out to the side.
- Depending on the dimensions of the transport route, it may be necessary to reposition the rollers on the carriage (Pos. a or b in Fig. 5) and bolt them in place.
  For this reason, the unit should be lowered on an appropriate wooden base.

⚠CAUTION	**When lowering the unit, the cable harnesses must not be damaged.**

- Move the unit to its installation location and place it next to the mounting plate.

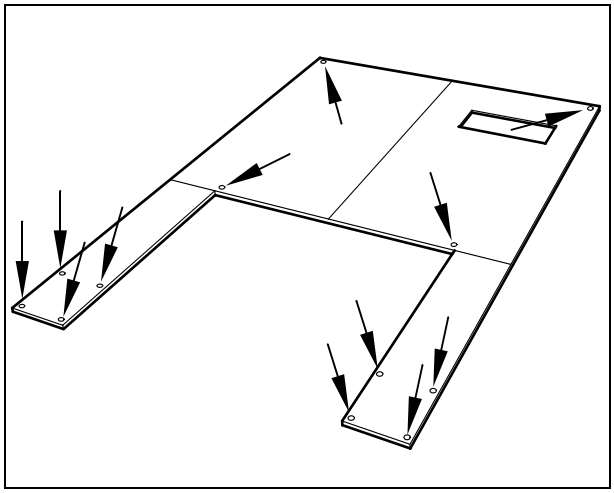


Fig. 6

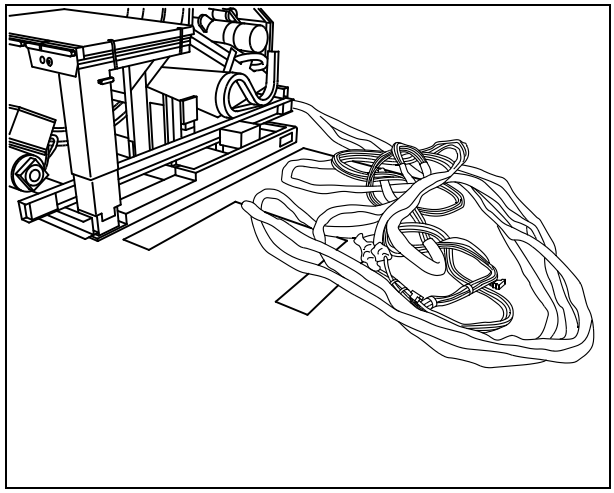


Fig. 7

- Put the insulation plates on top of the thoroughly cleaned mounting plate (Fig. 6) (the drill holes for the equipment must not be covered).
- Uncoil the four cable harnesses that are permanently connected to the unit and lay them out (Fig. 7).
- Guide the free ends of the cable harnesses into the opening in the mounting plate, and into the corresponding cabinets via the cable conduits.

NOTICE

The cable harnesses are color-coded:
- **blue for the shock wave cabinet**
- **green for the control cabinet**
- **yellow for the generator**

The correspondingly color-coded target connections are located in the cabinets.

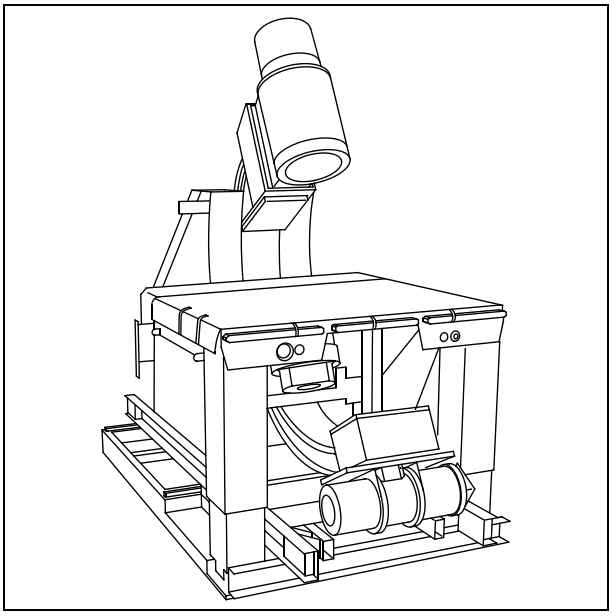


Fig. 8

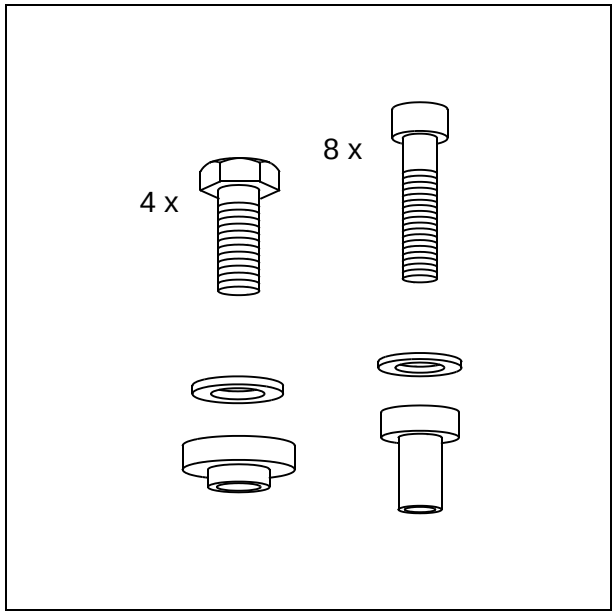


Fig. 9

- Move the unit so that it is positioned correctly over the mounting plate and so that it is level i.e., lower all four transport rollers evenly (Fig. 8).
- Mount the unit using 12 bolts and insulating sleeves on the floor. Apply Loctite 221 on the bolt threads to secure them (Fig. 9):

  - 8x Recessed socket head M 8 x 4 tighten to 24 Nm, ±10%
  - 4x Hex head M10 x 25

  (The bolts are contained in the box with service materials.)

- Remove the entire transport device.
- Remove the yellow shipping brackets on the W-drive.
- Measure the resistance to ensure that the unit is electrically isolated on the mounting plate.
- Carefully feed through the cable harnesses. Store any excess cable lengths. Roll them up without kinks.
  Do not place any excess cable or cable loops in the unit frame, since they may come into contact with the moving energy chain and become damaged.
  Do not block the movement of the energy chain.

⚠CAUTION	**Excess cable lengths may not be stored in the cabinets.**

- Remove the transport safety bracket from the I.I. collision protection.

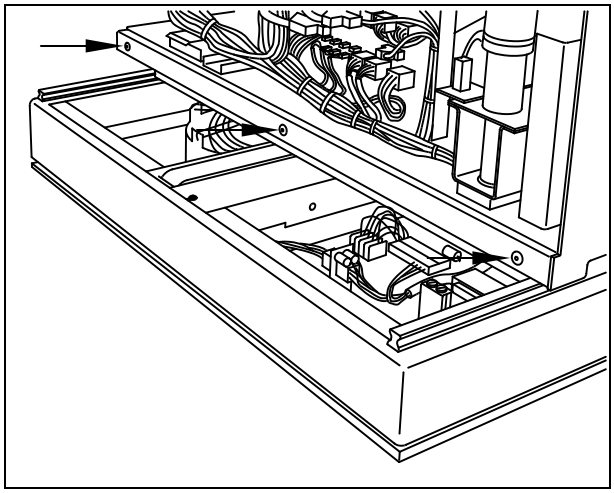


Fig. 10

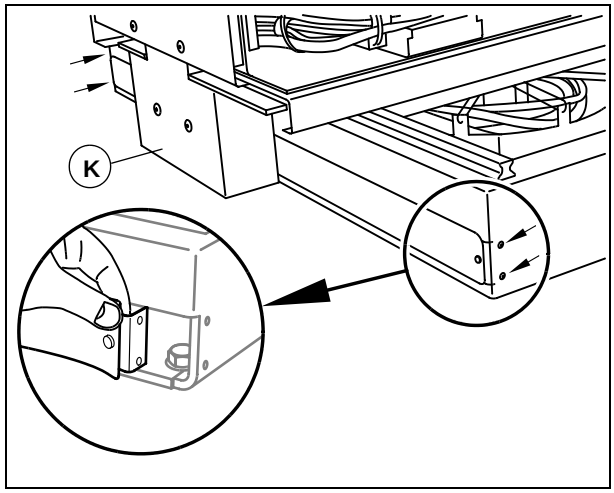


Fig. 11

Installing the Covers

For all visible surfaces, special paneling screws with 2.5 Allen sockets have been provided.

- The required screws and washers are already counted out and packed in plastic bags.

⚠CAUTION **Before installing the covers, connect each metal cover to ground; the connections are provided in the unit and on the cover panels themselves.**

- Secure the two lateral strips on the unit base frame with three paneling screws for each (↘ /Fig. 10).
- Install the rear metal roll-down sash in the unit base frame on the left and the right (↘ /Fig. 11); for this, the mounting brackets must be installed on the inside of the frame.
- Attach the cover (K/Fig. 11) for the cable routing using two paneling screws.

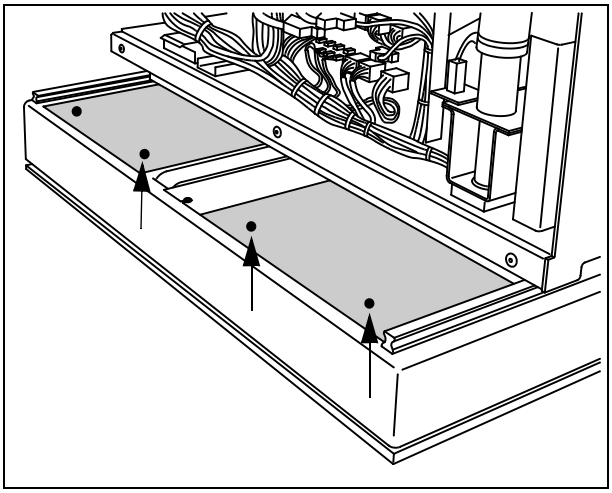


Fig. 12

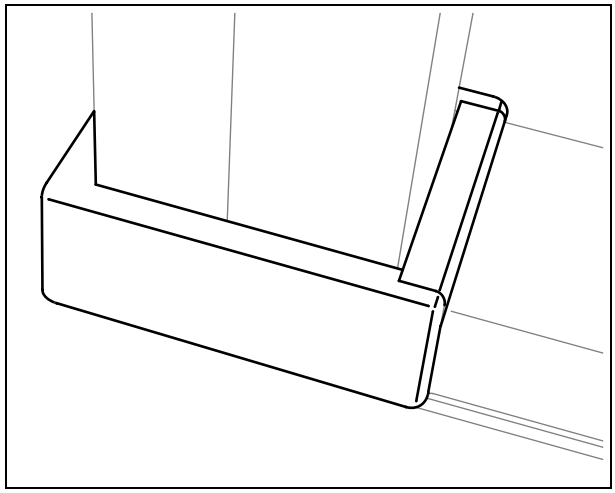


Fig. 13

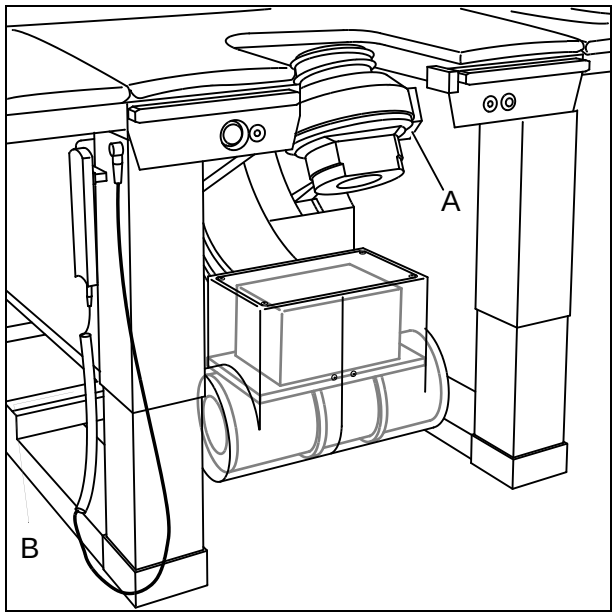


Fig. 14

- At this point you have to route the SONOLINE cables (see chapter 3, page 18 or chapter 4, page 22) if the ultrasound option is being installed.
- Insert the two-part base frame cover and mount it in place using four paneling screws for each part (↘ /Fig. 12).
- Install the kick plates on both table legs and fasten them together (Fig. 13).
- Attach the paneling to the underside of the shock head support (A/Fig.14).
- In the front section of the base frame (B/Fig. 14), use black plastic plugs to seal the two holes for mounting the transport carriage.

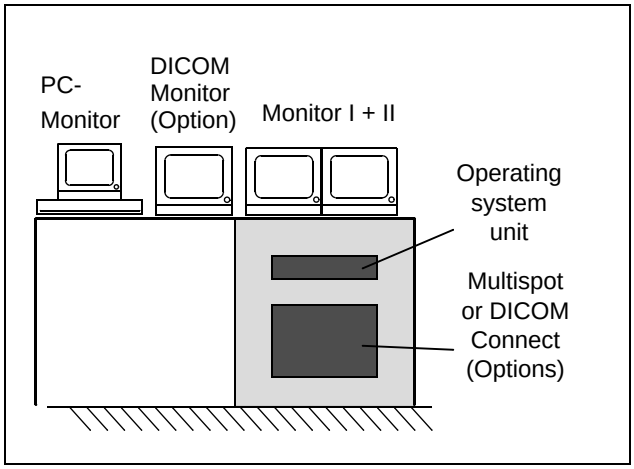


Fig. 15

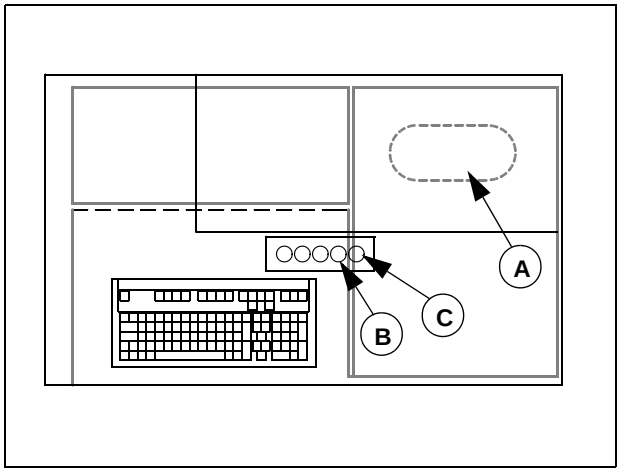


Fig. 16

Installing the Components for the System Controller

Setting Up the Console Table

The cable outlet (A/Fig. 16) is set up at the factory for downward cable feed-through. However, it is possible to route the cables to the back by punching out one of the perforated openings.

- Route the cable from the control console table to the control cabinet.
- If the Diamentor option is present, route the Diamentor cable from the electronics cabinet to the console table.

Positioning/Connecting the Monitors

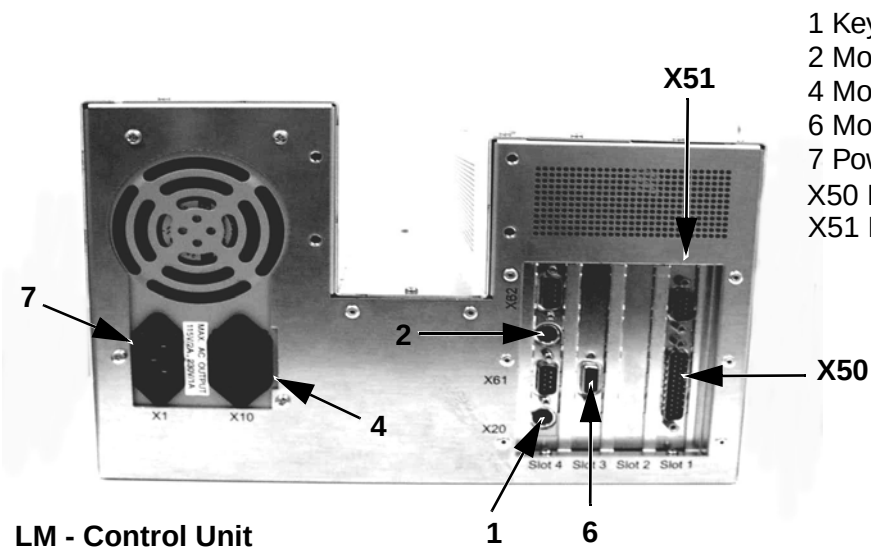
- Place the monitors on the control console table as shown in Fig. 15 and connect them per their designations.

Positioning the Keyboard and the PC Mouse

- Place the keyboard and the PC mouse on the control console table.
- Connect the cable to the keyboard.

Connecting the Footswitch, Tableside Control Console, Shock Wave Trigger Mechanism

- Connect the tableside control without the holder (optional) (B/Fig. 16) and the (C/Fig. 16) shock wave release control to the console table.
- Connect the footswitch for fluoroscopy (optional) either to the console table or to the unit:
  - Right back panel of the unit,
  - Under the foot support at the control console table.
- Connect the tableside control with the holder to the unit.
- Connect the unit footswitch (optional) on the right in back of the unit.



1 Keyboard port
2 Mouse port
4 Monitor power line connector
6 Monitor port
7 Power line connector
X50 Respirator-ECG signal interface
X51 DUEP port

LM - Control Unit

Fig. 17

Back panel of the PC

Positioning/Connecting the Operating System Unit (PC)

- Open the door on the console table and pull out the PC slide-out shelf.
- Position the operating system unit on PC slide-out shelf and secure it from below.
- Connect the cables for the mouse, the keyboard, the monitors and the DUEP cable at the PC (Fig. 17).
- Connect the power line cable to the operating system unit.
- Insert the slide-out shelf. Pay attention to the cable routing in the console.

Cover the cable outlet

- In areas where UL regulations apply,(e.g. USA) you must cover the cable outlet with the extra aluminum sheet located in the operating console as fire protection.

Positioning/Connecting DICOM Connect (Option)

- Perform installation and startup according to the manual RXL2-120.814.02..

NOTICE	**DICOM can be built into the LITHOSTAR Multiline only if no MULTISPOT is installed.**

Positioning/Connecting the Multiformat Camera (Option)

- Connect the Multispot per the designations and place it on the console table as shown in Fig.15 and tighten the screws. The cables can be found in the console table (power, video, control cable).

NOTICE

The two Allen screws in the base of the Multispot have to extend into the drilled holes of the intermediate plate in the operating cabinet. Depending on the customer's request, the drilled holes on the front or on the back can be used.

Positioning/Connecting the Diamentors (Option)

- Plug the power cable into the multiple socket outlet of the console desk (slide-out-shelf).
- Lead the cable up through the free opening.
- Connect the cable routed from the measuring chamber of the Diamentor via the adapter cable supplied.
- Connect the cable routed from power supply unit at the Diamentor.
- Position the Diamentor on the console desk.

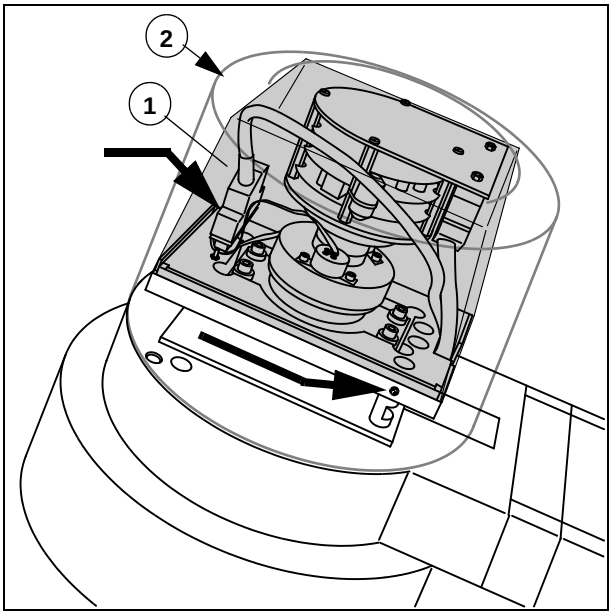


Fig. 18

Installing the TV camera on the 23" I.I.

- Remove the housing (1/Fig. 18) from the TV camera.
- Remove the cover of the I.I. optics (black lid).
- Remove the set screws on the longer sides of the TV camera.
- Place the TV camera on the I.I. and mount it with the two set screws (↘ /Fig. 18).
- Plug in the two connection cables on the TV camera and secure them (Fig. 18).
- Clamp the shielding of the camera cable D115.X2 under the clamp.
- Reinstall the TV camera housing (1/Fig. 18) but do not secure it.
- Connect the protective conductor to the white cover (2/Fig. 18).
- Place the white cover (2/Fig. 18) over the TV camera and secure it together with the housing.
- Use the white plastic plugs to cover the holes.

Installing the TV camera on the 33" I.I.

- The camera has been pre-installed at the factory.

Checking the temperature of the image intensifier

- Check the temperature indicators of the image intensifier according to the installation instructions regarding temperature checks with SIRECON units and OPTILIX tubes in RXD0-000.038.01... The results of the evaluation are recorded in the image quality protocol (IQC) during start-up.

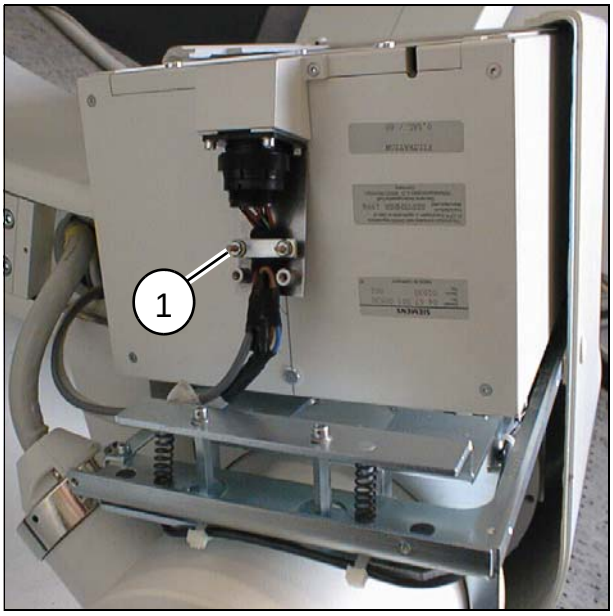


Fig. 19

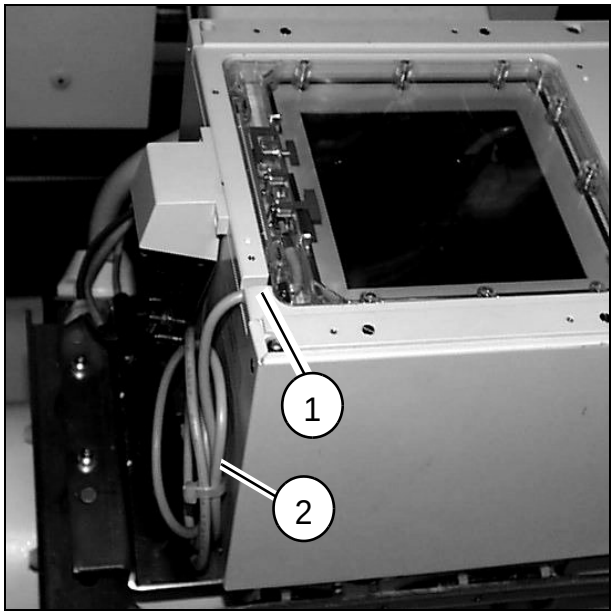


Fig. 20

Installing the Collimator

- Unpack the collimator.
- Remove the screws from the transport brackets at the side of the blades close to the focus.
- Check the adjustment of the blades close to the focus with the template.
- Attach the collimator to the tube unit.
- Plug in connector X1 on the collimator.
- Secure the wire to the panel using strain relief clamps (1/Fig. 19).
- Connect the plug.

Installing the Diamentor (Option)

- Remove the cover from the collimator.
- Insert the measuring chamber and lead the cable out through the opening (1/Fig. 20).
- Reattach the cover to the collimator.
- Plug the two connectors together and fix the cable with the cable ties (2/Fig. 20).

Installing the Simomed N44 monitor (OPTIONAL)

NOTICE	**Refer also to installation instructions RX53-020.031.06..**

- Remove the monitor housing.
- Slide the monitor onto the holder of the monitor trolley. The monitor should lock into position.
- Tighten the two rear screws.
- Connect the cables according to the labels.
- Clamp the shielding of the BAS lead under the clamp of the $VIDEO_{IN}$ cable.
- Establish the protective conductor connections.
- Reinstall the monitor housing.

System with Polydoros LX ⟶ chapter 3

System with Polydoros SX ⟶ chapter 4

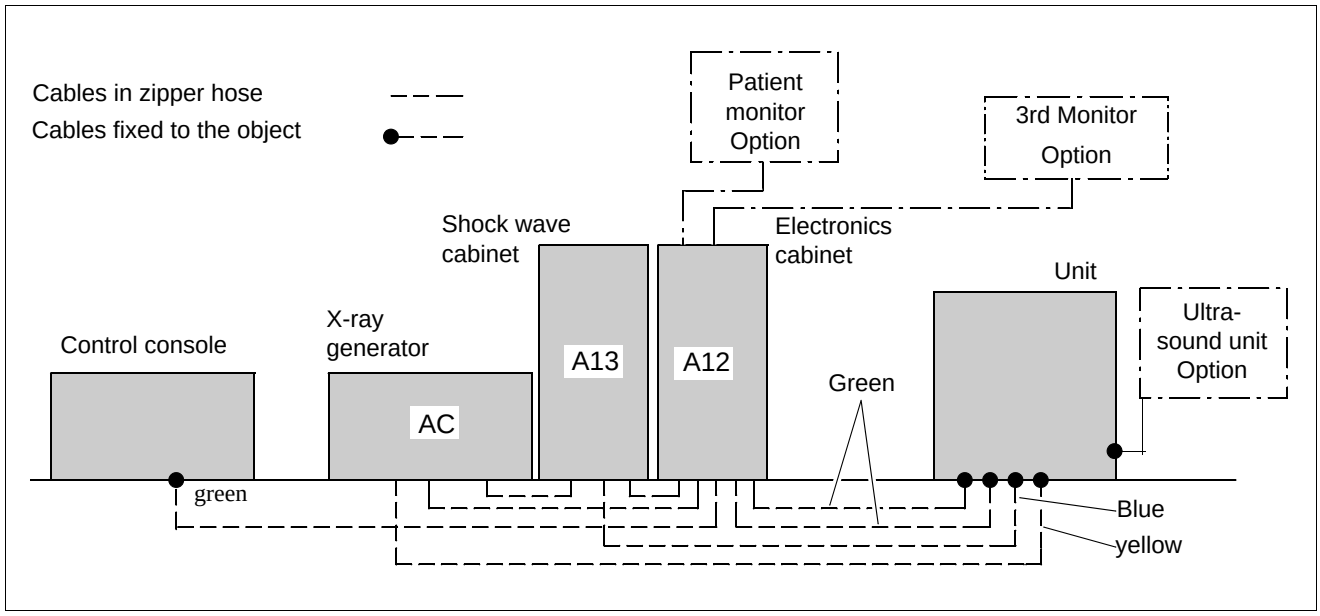


Fig. 1

General information

The cable harnesses are enclosed in zipper hoses and are color coded.
The specific target connection points for the harnesses have the same color coding in the cabinets:

X-ray generator, AC:	yellow
Shock wave cabinet, A13:	blue
Electronics cabinet, A12:	green

- The conductor and cable shields have to be connected at the ends with the corresponding clip.

⚠CAUTION **Do not open the connector housing on the cable between the camera and the VIDEOMED DI-M (D8.X1) under any circumstances.**

- Do not shorten the harness.
- Whenever possible, avoid overlapping or looping harnesses in the system and particularly in the cabinets. Do not store excess cable lengths in the cabinets (EMC reasons).
- Be careful that the cable harnesses do not get caught in the swing-out frames.
- Water hoses 5 and 8 may only be shortened by max. 5 m.

⚠CAUTION **Do not step on the hoses. Avoid small loops and kinks as this may damage them.**

Connections and cable locations in the A12 electronics cabinet

(green cable harnesses)

- Fasten the 3 cable harnesses (green) with the cable clip on the rail that is installed at the bottom of the electronics cabinet.

right - cable harness,green, from control console
centre - cable harness,green, from unit (K3, K4....)
left - cable harness, green, from unit (K8, K9....)

- Secure the braided shield of the zipper hoses to the locations provided.
- Route the cables in the A12 electronics cabinet as shown in the adjacent Fig. 2 and connect them according to table 1 and 3.
  The numbers or letters (e.g. (4)) are located in the cable lists on the following pages.
- Prior to routing the system cables, remove the EMC shielding plate at N11 D11.

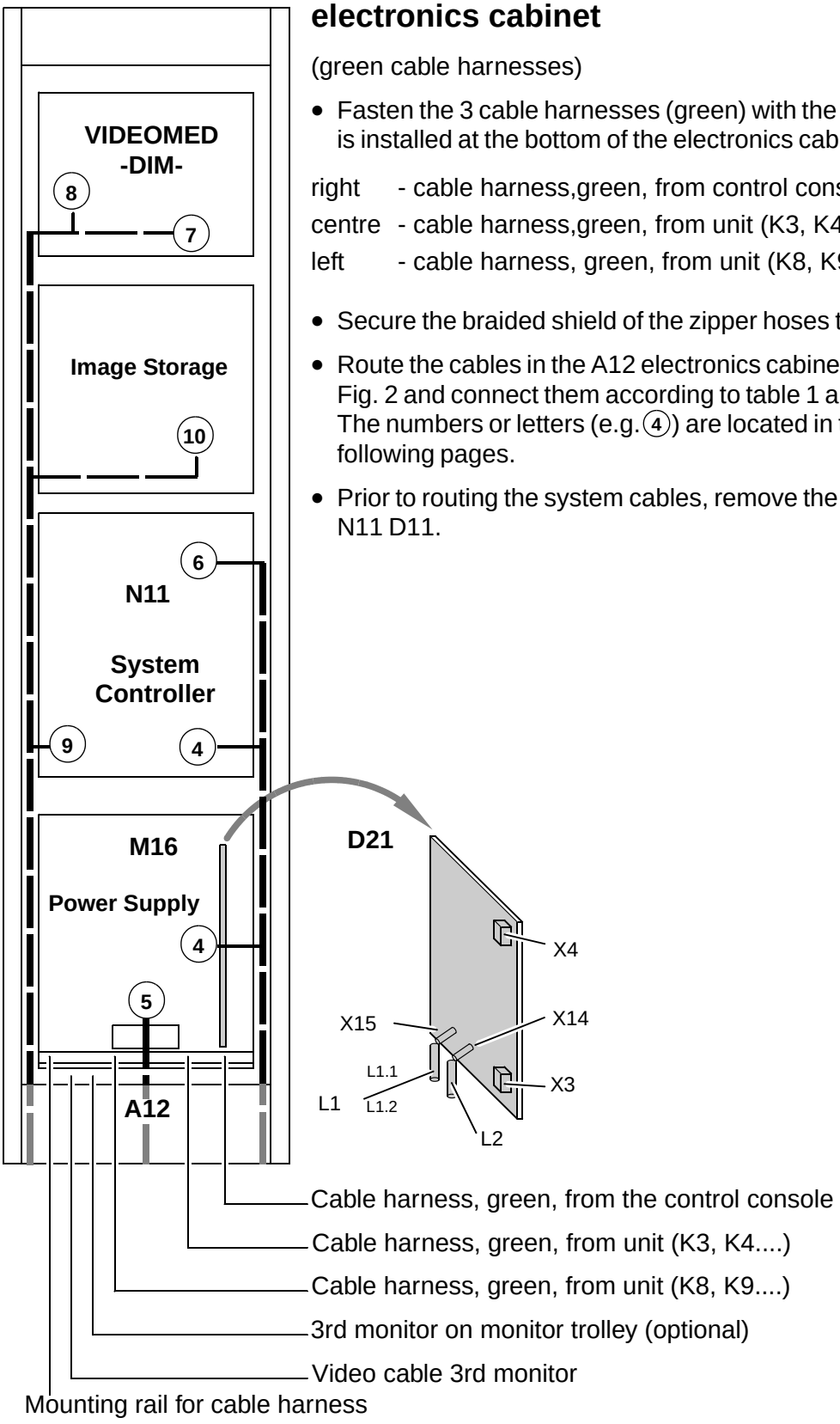


Fig. 2

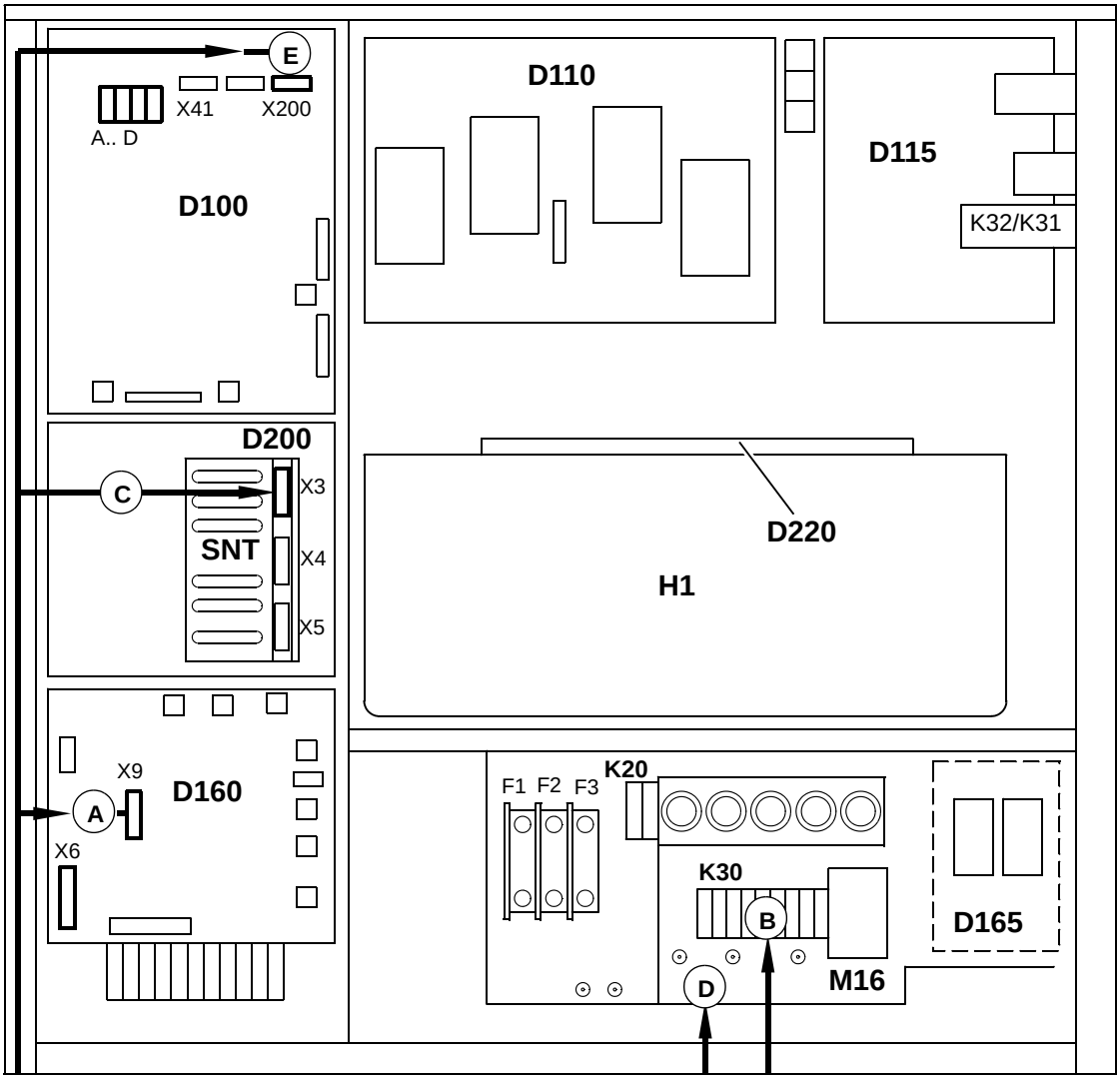


Fig. 3

Connections/cable locations in the generator cabinet (Part A)

- Route the cable harnesses in the generator cabinet as shown in Fig. 3 above, and connect them as indicated in Tables 1 and 2:

Multiline power line connections (B)

- Connect the power harness for the Multiline in the M16 at terminal strip K30 (Ⓑ /Fig. 3) (see also the POLYDOROS LX Wiring Diagram, X2169-11):
  - K30.L1, L2, L3 (is switched over the GS breaker with generator **ON**).
  - K30. N and K30.⏚ terminal pins (Ⓓ /Fig. 3).
- Strain-relieve the power harness (shielding under the clamp).

AC Generator - A12 Electronics Cabinet - A13 Shock Wave Cabinet Connections					
Type cable/ connection	**Function**	**Generator AC**	**A12 Cabinet**	**A13 Cabinet**	**ok**
4 x 4 mm^2 + Gnd, shielded	MULTILINE power supply	M16.k30, ⏚ (B) L1, L2, L3, N	M16.X1 ⏚, N (5) F7, F8, F9		
1 x 6 mm^2	Protective conductor	M16.k30, ⏚ (D)	M16, ⏚ (5)		
9 pole Canon	XCS	D200.X3 (C)	VDIM.D5.X13 (7)		
9 pole Canon	Act. value interface	D100.X200 (E)	N11.D6.X8 (6)		
3 x 1.5 mm^2, shielded	A13 Power supply		M16.X2. (5) L3, N, PE	N12.X1. (2) L, N, PE 1)	
1 x 6 mm^2	Protective conductor		M16, ⏚ (5)	base ⏚ 1) (2)	
Canon	Controller		N11.D11.k104 (4)	N12.k104 1) (2)	

Tab. 1

1) Connections and cable position in cabinet A13 see fig. page 3-11

System Operating Console - Generator Connections This cable is located in the “System control console-Electronics Cabinet” zipper hose					
Type of cable/ connector	**Function**	**In Control Console**	**in AC Generator**		**ok**
15 pole, Canon	System ON/OFF	Door	D160.X9	(A)	

Tab. 2

Connecting the XCS harnesses (C) and (E)

- Pull the **XCS** harnesses (coming from the electronics cabinet) on the **left** side into the power cabinet, guide them up and connect them on boards D100.X200 (E) and D200.X3 (C) per their designations (Fig. 3).
- Strain- relieve the harnesses using cable ties.

Control console connections

- Plug in the control console harness on board D160.X9 as shown in Table 2 ((A) /Fig. 3).
- Strain- relieve the harness on the side using cable ties.

Power and voltage supply connection, protective conductor connection in A12				
Type of cable/connection	**Function**	**Device / control console**	**Cabinet A12**	**ok**
1 x 16 mm^2 Cable harness in the middle	Protective conductor	Device PE	M16.PE ⑤	
3 x 1.5 mm^2, shielded cable harness in the middle	Power connection Z96	Device X11.1, 2, 3	M16.X2 ⑤ L1, N, PE	
4 x 2.5 mm^2, shielded cable harness in the middle	Voltage supply of the output stages	Device K1	M16/D21. ④ X14, L1.2	
3 x 1.5 mm^2, shielded cable on the right	Power connection control console	Socket control console	M16.X2 ⑤ L2, N, PE	
1 x 6 mm^2 Right cable harness	Protective conductor	PE control console	M16.PE ⑤	

Tab. 3

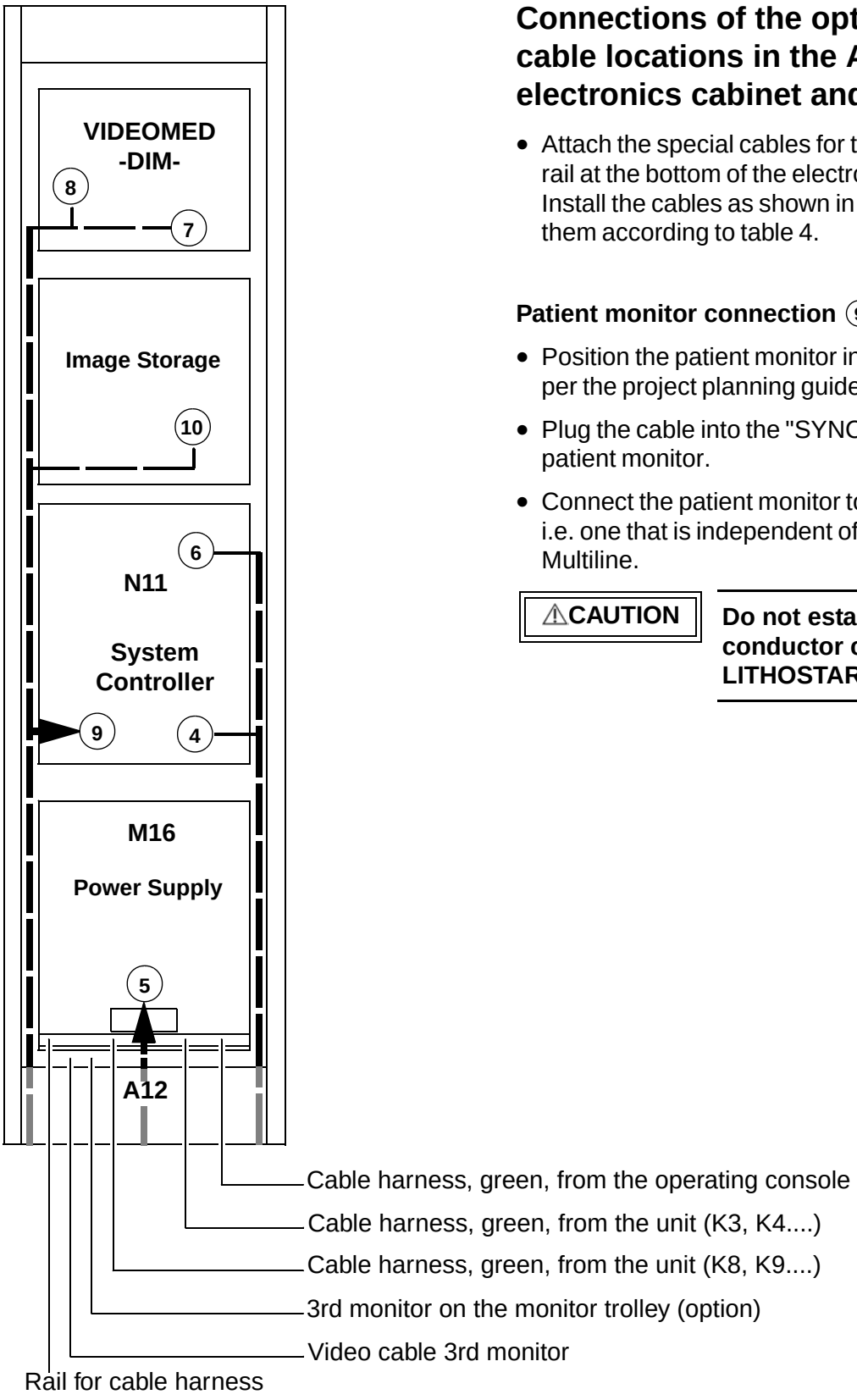


Fig. 4

Connections of the options and their cable locations in the A12 electronics cabinet and generator AC

- Attach the special cables for the 3rd monitor to the rail at the bottom of the electronics cabinet A12. Install the cables as shown in Fig. 4 and connect them according to table 4.

Patient monitor connection (9)

- Position the patient monitor in the location provided per the project planning guide (e.g. ceiling support).
- Plug the cable into the "SYNC" connector of the patient monitor.
- Connect the patient monitor to its own power supply, i.e. one that is independent of the LITHOSTAR Multiline.

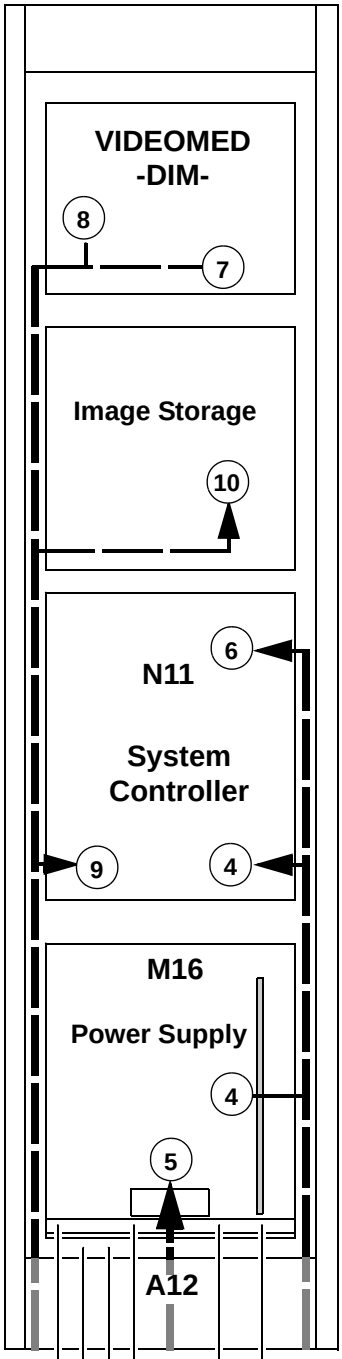
⚠CAUTION

Do not establish any protective conductor connections to the LITHOSTAR.

Connections for the Options in the A12 Electronics Cabinet or in the AC Generator				
Type of cable / connector	**Function**	**Optional Unit**	**In the A12 Cabinet or in the AC Generator**	**ok**
3 x 1.5 mm^2	Line voltage	3rd Monitor * Ⓐ	A12/M16.X2.L2, N, PE ⑤	
1 x 4 mm^2	Protective conductor	Monitor trolley	A12/M16 ⏚ ⑤	
Coax cable	Video	Monitor trolley	A12/Monitor 3_{in}	
	Radiation ON display	Monitor trolley	AC/D160.X6 see generator wiring diagram X2169-11	
K14	ECG control	Patient monitor "SYNC"	A12/N11/D11.k14 ⑨	

Tab. 4

* Ⓐ The monitor cable contains more cable than necessary for connecting the LITHOSTAR Multiline. Roll up the additional cables and place them in the control cabinet.



Cable harness, green, from the control console

Cable harness, green, from the unit (K3, K4....)

Cable harness, green, from the unit (K8, K9....)

3rd monitor on the monitor trolley (option)

Video cable 3rd monitor

Mounting rail for cable harness

Fig. 5

Connections and cable locations in the A12 electronics cabinet and in the control console

(cable harness, green)

- Route the cables in the A12 electronics cabinet, as shown in Fig. 5 and connect them as shown in Table 5, 6 and 7.

VIDEOMED connection: (8)

- Remove the XCS cables X11 and X12 from the D5 board.
- Remove the EMC shielding on the Videomed.
- Route the camera connector D8.X1similar to the video cable underneath the rack and connect it to the backplane as shown in Table 5.
  Remove board D1 for this purpose.
- Attach the cable with a cable clip to the rack above the shield.
- Attach the EMC shielding on the Videomed.
- Connect the XCS cables X11 and X12 on the D5 board.

Unit - A12 Electronics Cabinet Connections (left Cable Harness, green)				
Type of cable / connector	**Function**	**In Unit**	**In Cabinet**	**ok**
12 pole connector, k8	Motor controller I	D32.X54	N11/D11.K8 ⑨	
12 pole connector, k9	Motor controller II	D32.X55	N11/D11.K9 **3)** ⑨	
Special connector	Control and power supply for the collimator	Collimator, Z66.X1	N11/D6.X3 ⑥ M16/D21.X4 ④	
Special	Camera	Camera, D115.X2	VIDEOMED DI-M D8.X1 on back-plane **4)** ⑧	
Special	Dose measurement chamber (optional Diamentor)	Measurement chamber collimator	Diamentor (Control console)	

Tab. 5

3) Remove EMC shielding on the D6 board
Insert cable
Reattach the EMC shielding and make sure that the cable is in the recess of the EMC cover.

4) After connecting D8.X1, install the EMI shielding plate.
(refer also to VIDEOMED connection in Chapter 3 page 8).

Unit - A12 Electronics Cabinet Connections (center Cable Harness, green)					
Type of cable / connector		**Function**	**In Unit**	**In Cabinet**	**ok**
4 pole connector	k7	Power supply for the magnetic brakes	D31.X34	M16/D21.X3 ④	
37 pole connector	k3	Incremental sensor	D31.X30	N11/D11.K3 ④	
37 pole connector	k4	Actual values	D31.X31	N11/D11.K4 ④	
37 pole connector	k5	Switches and DÜP	D31.X32	N11/D11.K5 ④	
50 pole connector	k6	Motor and magnetic brake control	D31.X33	N11/D11.K6 ④	
9 pole connector	k12	Zoom selection		N11/D11.K12 ④	
9 pole connector	k13	Respirator sensor connection	D27.X1	N11/D11.K13 ⑨	

Tab. 6

System Control Console - Electronics Cabinet Connections (right Cable Harness, green)				
Type of cable / connection	**Function**	**In Control Console**	**In A12 Cabinet**	**ok**
25 pole, Canon	Controller	Slide-out shelf	N11/D11.K11 ④	
9 pole, Canon	4 channel ECG - monitor	4 channel ECG - monitor	N11/D11.K103A ⑨	
Coax video cable	Video input Monitor 1_{in}	1.Video monitor Monitor 1_{in}	MEMOSKOP,X11 8) ⑩	
Coax video cable	Video input Monitor 2_{in}	2.Video monitor Monitor 2_{in}	MEMOSKOP,X12 8) ⑩	
Coax video cable	Video connection Monitor 1 ⇒Monitor 3	3.Video monitor 9) Monitor 1_{out} 7) Monitor 3_{in}	o to 3rd monitor if configured 10) ⑩	
Coax video cable	Hardcopy input	MULTISPOT 9)	MEMOSKOP, X10 8) ⑩	
9 pole, Canon	Hardcopy control	MULTISPOT 9)	MEMOSKOP, X4 8) ⑩	

Tab. 7

- connect to the monitor, only if a third monitor is present. **7)**
- Options **9)**
- The coaxial cable should be attached with a cable clip to the rail in the electronics cabinet A12. Electrically Isolate the coaxial plug from the rack of the cabinet. **10)**
- Check the switch positions on the back of the monitors and ensure that the setting is as follows:
  - Video signal to 0.3 V.
  - If no third monitor is present, terminate both monitors at 75 Ohms.
  - If a third monitor is present, set the output of the first monitor to high.
- Reattach the EMC shielding plate on the N11 D11. Make sure that all the cables are in the recesses and will not get damaged when reattaching the shielding plate.
- After connecting the MEMOSKOP cabling, reinstall the MEMOSKOP cover. **8)**
  The cable shielding must be under the corresponding clamp.

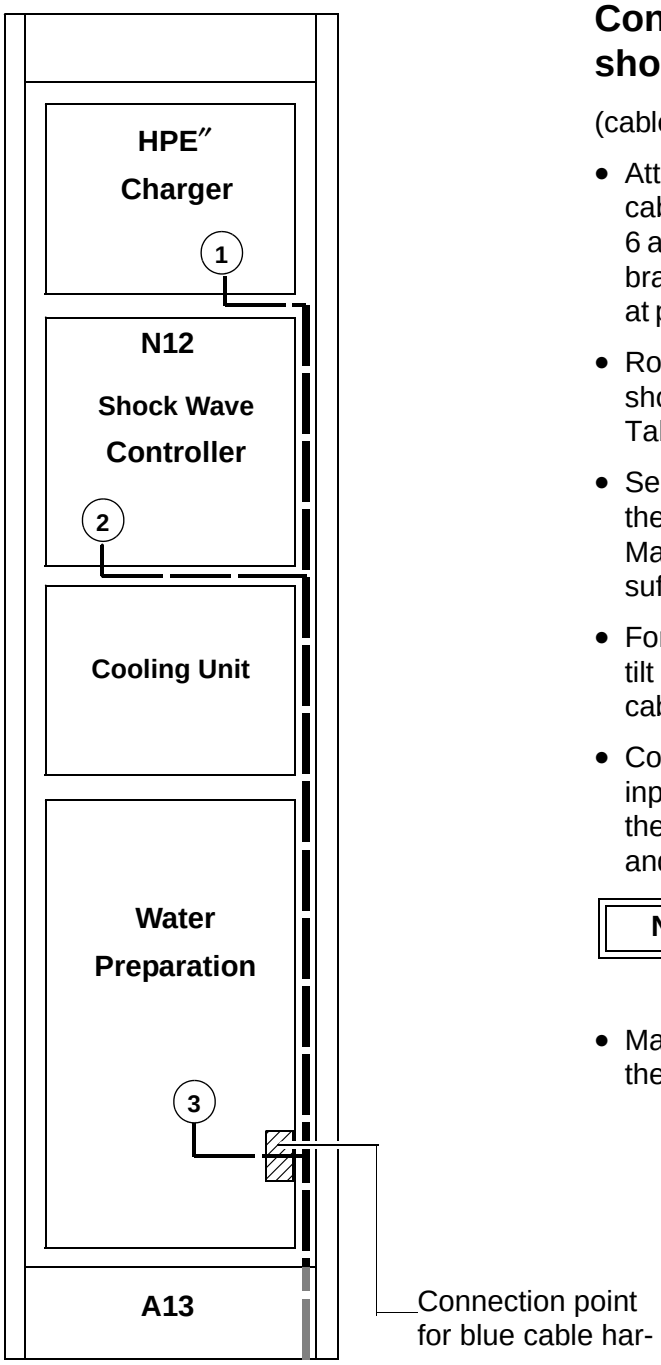


Fig. 6

Connections/cable locations in the A13 shock wave cabinet

(cable harness, blue)

- Attach the blue cable harness in the shock wave cabinet A13 on the front and back cabinet rack at pos. 6 and 7 with cable clips. Refer to Fig. 6. Attach the braided shield of the zipper hose to the plate provided at pos. 8 /9.
- Route the cables for the A13 shock wave cabinet as shown in the Fig. left and connect them as shown in Table 8.
- Secure the cables leading to N12 with cable ties on the right side of position 50/52.
  Make sure the conductors to D19 and D91 have sufficiently long.
- For connecting the cables to the charger you have to tilt M12 toward the front. Use cable ties to secure the cables on the right side of position 67/68.
- Connect the hoses for the **water connections** at the input/output point (3) in the shock wave cabinet per their designations or as shown in connection Table 8 and secure them with hose clamps.

NOTICE	**The hoses must not be shortened by more than 5 m, if required**

- Make sure there are no kinks in the hoses and that they are secured.

Connection, Unit - A13 Shock Wave Control Cabinet (blue cable harness)				
Type of cable / connector	**Function**	**In Unit**	**In Cabinet**	**ok**
Special	Trigger lead	X2, Power unit	N12.X2 ②	
"	Test lead U/2	X5, Power unit	N12.D91.X2 5) ②	
"	Test lead $U_{meß}$	X4, Power unit	N12.D91.X2 5) ②	
"	Test lead $I_{meß}$	X3, Power unit	N12.D91.X3 5) ②	
EK20 special	Fan power supply	X40, Power unit	N12.K4 ②	
EK20 special	Coupling	X12, coupling assembly	N12.K5 ②	
9 pole, Canon	Coding	X13, Power unit	N12.K103 ②	
9 pole, Canon	Shock head sensors	X11, Shock wave head	N12.K101 ②	
9 pole, Canon	Coding	Shock wave head	N12.K102 ②	
Special	K26 charger lead	X1, Power unit	Charger 6) ①	
1 x 4 mm^2	Protective conductor	⏚ Power unit	PE, Charger 6) ①	
Type of hose				
Water	Cooling system intake	Shock wave head	5 Exchanger ③	
Water	Cooling system return	Shock wave head	8 Exchanger ③	

Tab. 8

5) Allow enough cable length so that the boards can be unplugged with the cables still connected.

6) - To connect these cables, swing the N12 out towards the front.

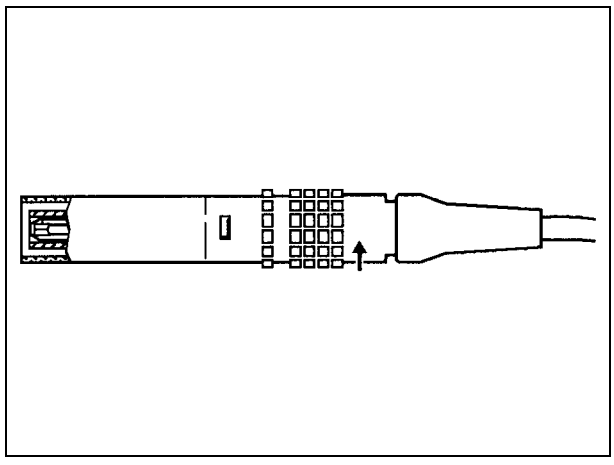


Fig. 7

- Check that the screw connections of the high voltage connector K26 are tightened securely (refer to Fig. 7 on the left).
- Insert the connector of high voltage cable K26 on the bottom of the charger until it locks audibly into position.
- The connection (jumper) between ⏚ and 0V must be present.

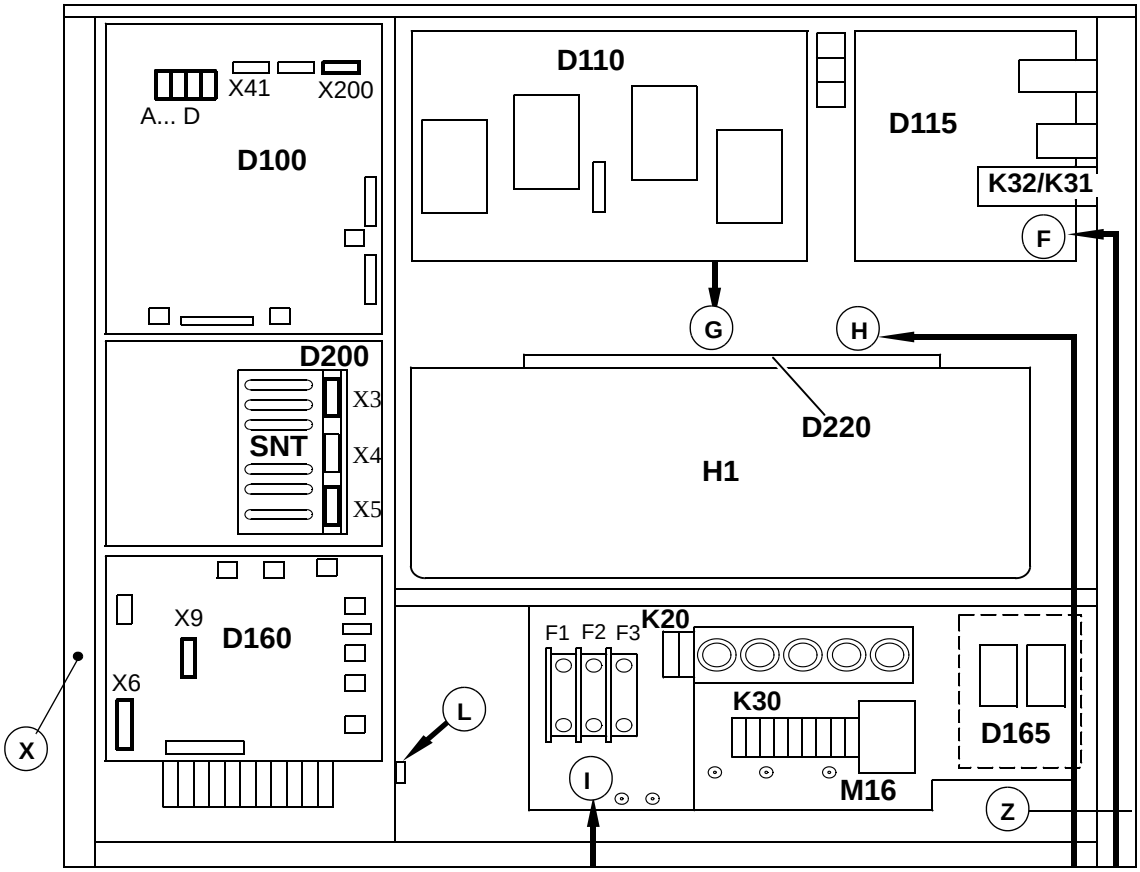


Fig. 8

Connections/Cable Locations in the Generator Cabinet (Part. B)

- Route the cables in the generator cabinet as shown in Fig. 8 above, and connect them in accordance with Table 9:
- Install the yellow cable harness in the generator cabinet below M16. Connect the shielding of the zipper hose to the ⏚ bolt in M16 (Ⓘ /Fig. 8). To strain-relieve the zipper hose, attach it with a cable tie to the left intermediate plate of the cabinet near the floor (Ⓛ /Fig. 8).

Rotating anode cable connection

- Route the rotating anode cable (internally required length approx. 1 m) up along the **right** side in the frame of the generator cabinet to the anode starter (Ⓕ /Fig. 8).
- Connect the braided shielding (external shielding) of the end of the lead to the right side of the starter unit under one of the clamps (Ⓕ /Fig. or 1/Fig. 9).
- Connect the red cable (inner shielding) to (3/Fig. 9).
- Strain-relieve the cable using cable ties (2/Fig. 9).
- Connect the rotating anode cable to the breaker of the **anode starter** (Ⓕ /Fig. 8):

On breaker, contact:	K31/R2	K31/R4	K32/R2
Anode cable leads:	I / 1	0	II / 2

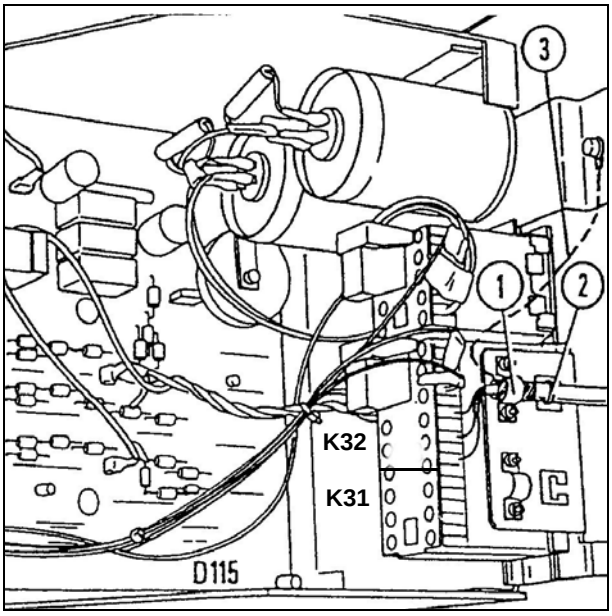


Fig. 9

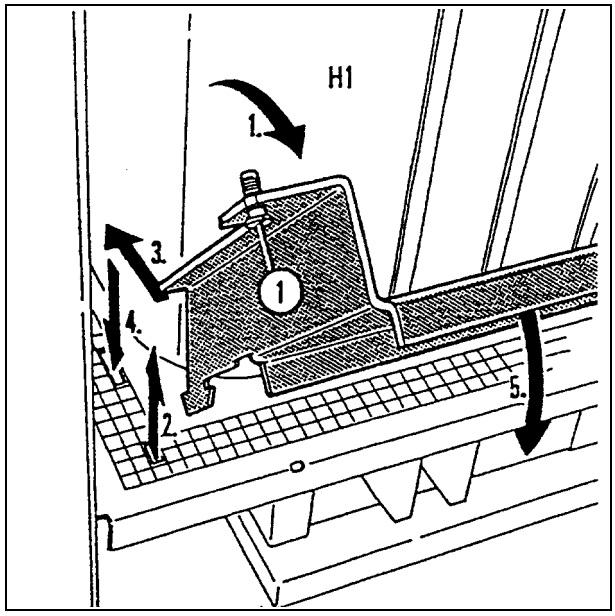


Fig. 10

Generator - Unit Connections (Cable Harness, yellow)					
Type of Cable	**Function**	**Generator**		**System**	**ok**
Stator cable 3 x 0.75 mm^2	Rotating anode drive	Anode starter K31.R2, R4, K32.R2	Ⓕ	X-ray tube I, 0, II	
2 x HSK	HV power supply	HV-Transf. H1.API	Ⓗ	X-ray tube	
1 x 6 mm^2	Protective conductor	⏚ - bolts (on M16 under K20)	Ⓘ	X-ray tube	
3 x 0.25 mm^2	Oil pressure switch	D160.x6.1 u. x6.3 shielding at Ⓧ	Ⓧ	X-ray tube	
Iontomat	No function on the Polydoros LX				

Tab. 9

Connecting the H1 High Voltage Transformer

- Remove the inverter cover and open the bayonet connectors (1/Fig. 10).
- Change the position of the transformer mount (Fig. 10) and swing it out.
- Place the high voltage transformer on the transformer mount.
- Route the high voltage harnesses up to the high voltage transformer (3/Fig. 11).
- Check the oil level in the high voltage receptacles (approximately 1 cm); if necessary, refill with oil (part no. 44 10 023 RV090 1 liter).
- Insert the high voltage plug without silicone disk but with silicone gasket into the correct receptacle of H1 (Workstation 1).

- Slide the H1 high voltage transformer into the generator cabinet.
- Change the position of the transformer mount (Fig. 10), lift it, and lock in the bayonet connectors (1/Fig. 10) of the mount.
- Connect the high voltage cable shielding to (Z/Fig. 8) (if the shielding is not accessible in the clamping area, remove the outer insulation).
  The clamps are located in the generator service packet.

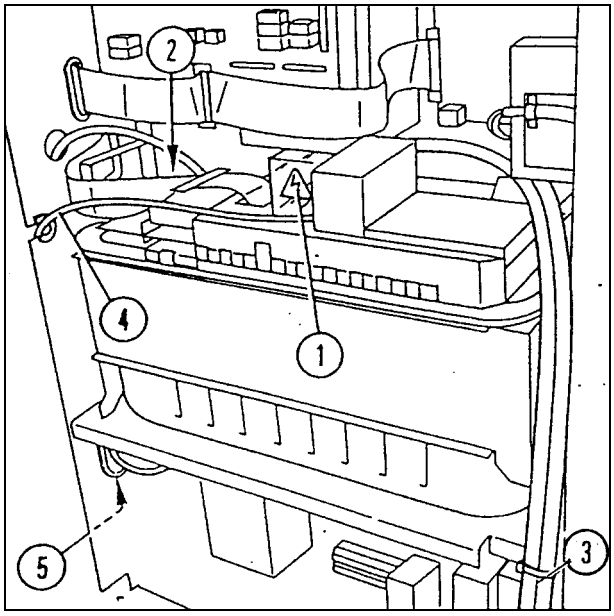


Fig. 11

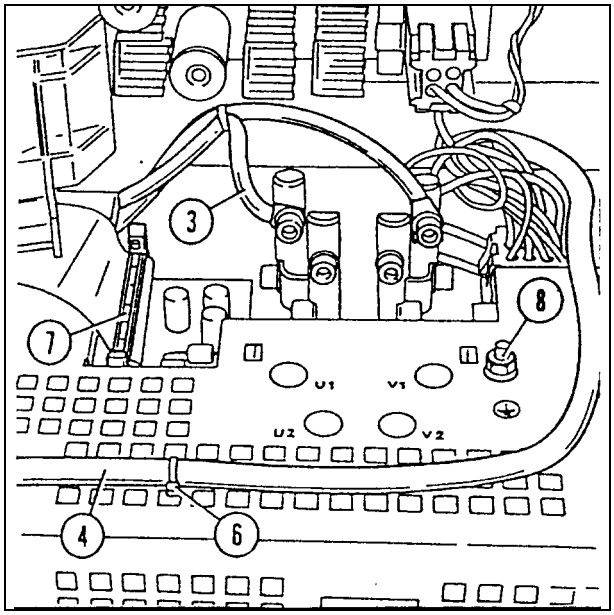


Fig. 12

- Use cable ties to strain-relieve the cables (3/Fig. 11).
- Carefully remove the plastic guard plate for board D220 with ϟ symbols (1/Fig. 11).
- Connect the protective conductor strap to the H1. ⏚ (2/Fig. 11).
- Attach the (primary) leads H1.U1 and H1.V1 of the inverter module per the designation onto H1 (3/Fig. 12).
- Route the cable connected to D220.X41 (4/Fig. 11/12) down to the D160 board and connect it to X44.
- Clamp the braided shield of the cable under the clamp (5/Fig. 11).
- Use cable ties to strain-relieve the cable at H1 (6/Fig. 12).
- Plug the flat cable X1 from board D100 to connector X1 on board D220 (7/Fig. 12) and strain-relieve it on the cover (shielding underneath the strain relief).
- Reinstall the guard with the ϟ symbols (1/Fig. 11).
- Check the nuts on the protective conductor studs (8/Fig. 12) and tighten them, if necessary.

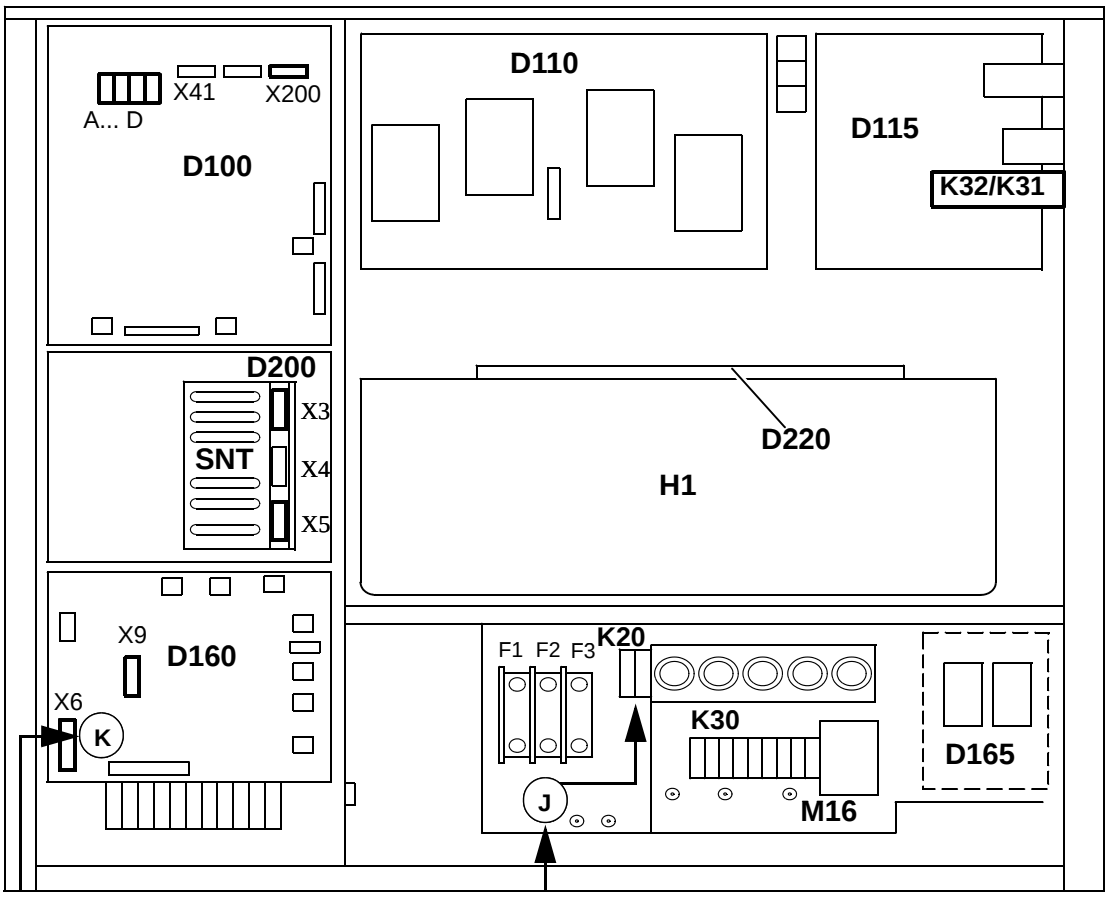


Fig. 13

Connections/harness locations in the generator cabinet (Part C)

- Route the harnesses in the generator cabinet as shown in Fig. 13 above, and connect them in accordance with Table 10:

Generator power line connection (J)

Nominal Line Voltage: 400 V ± 10%.

- Secure the screw type terminals from the service packet to the conductors of the power cable. If the power cable diameter is small enough, turn the clamps 180° (both curvatures opposite to each other).
- Insulate the harness terminals that have been installed using heatshrink tubing.
- Remove the cover over the knife breakers F1, F2 and F3 (J /Fig. 13) at the M16 of the generator.
- Connect the power line leads L1, L2, L3, N, PE to the fuses F1, F2, F3 (connection J /Fig. 13) and to terminal strip K20. N and ⏚.
- Strain-relieve the power cable on the bottom plate of POLYDOROS LX. Do not allow this to connect to any existing shielding on the power cable.
- Reinstall the cover over the knife breakers.

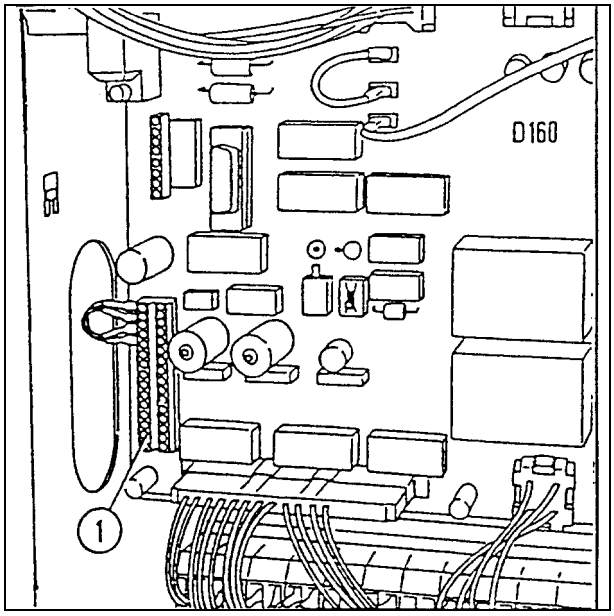


Fig. 14

Generator - Periphery						
Type of Cable	**Function**		**Generator**			**ok**
Power line cable 3/N/Gnd	System power line connection		M16. F1, F2, F3, N, ⏚	(J)	Main distributor L1, L2, L3, N, ⏚	
2 x 0.75 mm^2	Radiation protection	9)	M16.D160.X6	(K)	Door contact	
2 x 0.75 mm^2	Radiation buzzer Radiation display	9)	M16.D160.X6	(K)	Radiation indicator lamps	

Tab. 10

9) Option

Connecting the options (K)

Pilot lights and radiation protection indicators

At the customer's request or when country-specific regulations require (e.g. DHHS), the following pilot lights and displays can be connected in the POLYDOROS LX to D160.X6 (1 /Fig. 14):

- Door contact for blocking the exposure release. If a door contact is required, it must be connected in series with the oil pressure switch.
  (Have the door contact activated e.g. by the examination room door.)
- External radiation indicator lamp
- Remove the corresponding jumper and connect the function according to wiring diagram X2169-11. If necessary, pull the left part of the D160.X6 plug out from the side.

Ultrasound option

NOTICE **Unpack and assemble the SONOLINE according to the instructions.**

Type of Cable	Function	Ultrasound system	Multiline		ok
			Unit	Cabinet A12	
1 x 4 mm^2	Protective conductor	Rear panel	Protective conductor terminal		
3 x 0.75 mm^2 shielded	Voltage supply	Rear panel	refer to text		
Canon 9 pole	Control cable	Ultrasound tableside control	D31.X28		
Fiber optic cable	Communication	Rear panel		N11.D6	
Video		Rear panel		w/o function	

Tab. 11

For 230 V Sonoline line voltage

- Connect the cables to the power line terminal NK 1, 2, 3 (Fig. 15)
- Shielding see A/Fig. 15

For 115 V Sonoline line voltage

(the required parts are located in the 115 V power supply packet)

- Attach the supplied grounded instrument connector (female connector) and the nozzle to the 115 power supply cable routed into the case frame by the customer.
- Connect the grounded instrument connector (male connector) and the nozzle to the power line cable from the corrugated hose.
- Plug the two grounded instrument connectors together (corrugated hose - power supplies).

- Connect the protective conductor to the clamp (figure 15).
- Connect the control cable to D31.X28 (figure 15). This is possible only after moving the system.
- Route the fiber optic and video cables to the control cabinet. (Refer to the installation instructions for fiber optic cables /module RX0-000.038.02...).
- Route the video cable into the control cabinet (not used).
- Connect the ultrasound tableside control to SONOLINE.
- Connect the ultrasound probe and place the probe in its holder.
- Move board D6 slightly away from N11 to facilitate this.
- Plug the fiber optic cable into N11 on board D6 (according to color code). Secure the fiber optic cable with cable clamps to the right side of the cabinet.
- Connect the corrugated hose to the Sonoline.

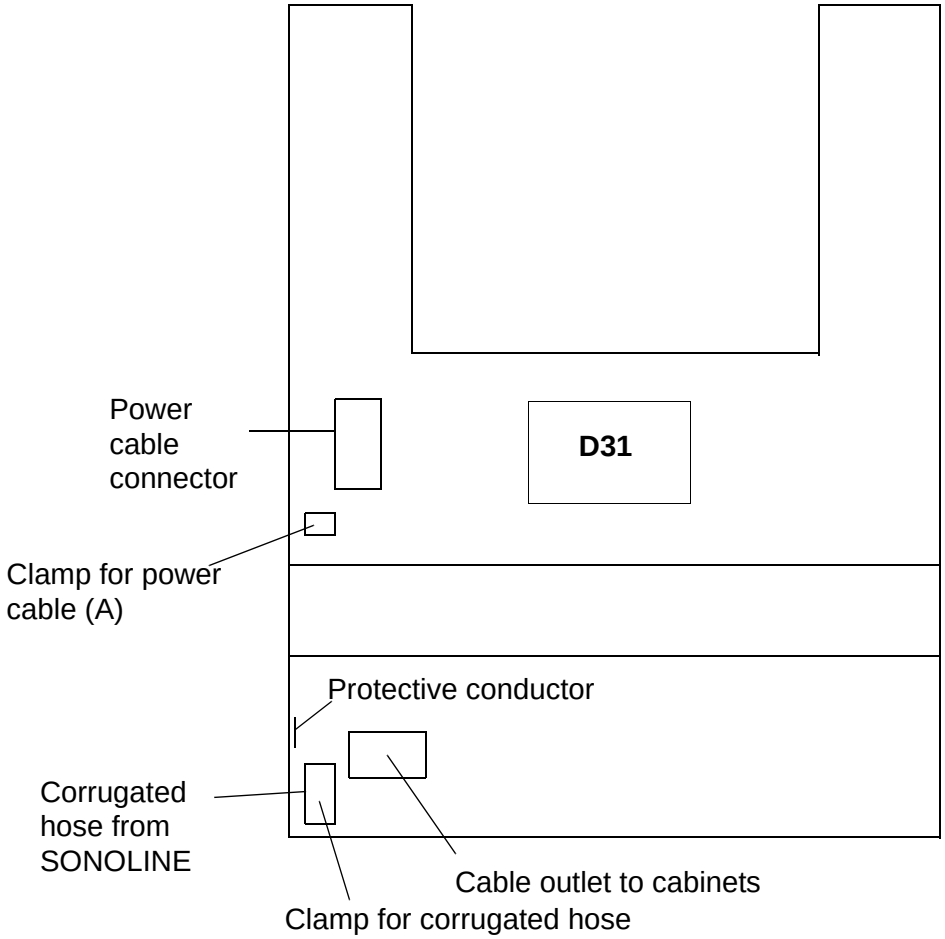

Power
cable
connector
D31
Clamp for power
cable (A)
Protective conductor
Corrugated
hose from
SONOLINE
Cable outlet to cabinets
Clamp for corrugated hose

Fig. 15

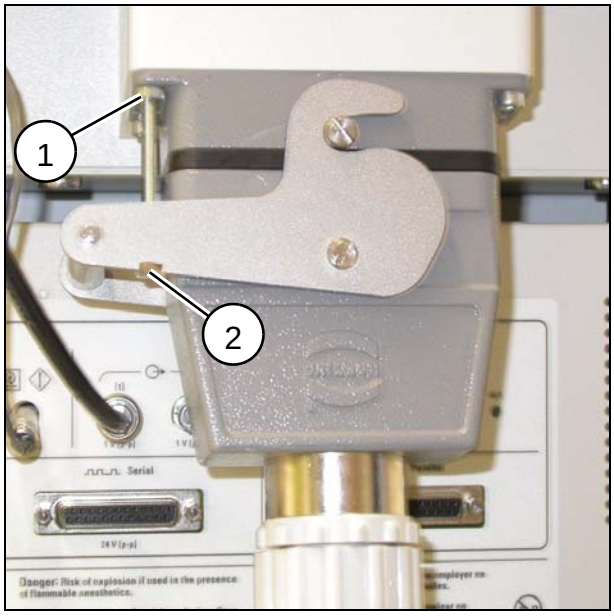


Fig. 16

Fastening of plug, Sonoline

- Remove the existing screw at point (1/Fig. 17).
- Screw in the mounting screw according to Fig. 17. The clamp (2/Fig. 17) prevents loosening the plug connection without tools.
- Tighten the counternut (1/Fig. 17).

NOTE	**CE approval is valid for the entire system only. If the ultrasound unit is removed, then this does not retain the required CE approval.**

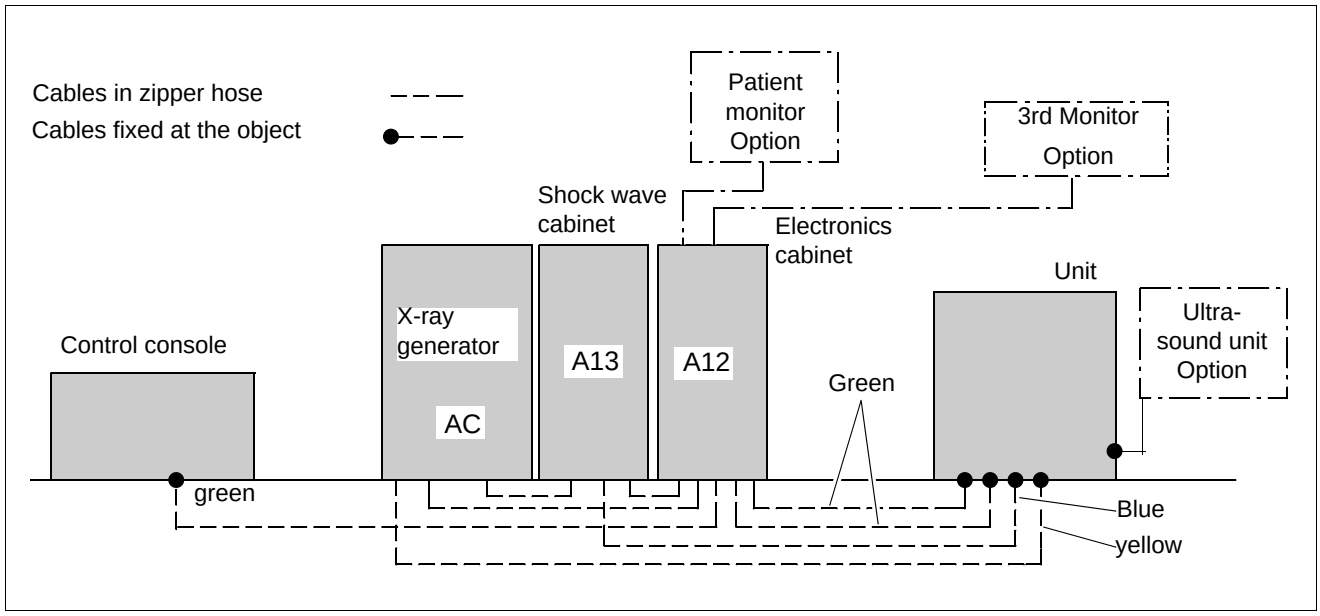


Fig. 1

General information

The harnesses are enclosed in zipper hoses and are color coded. The specific target connection points for the harnesses have the same color coding in the cabinets:

X-ray generator, AC:	yellow
Shock wave cabinet, A13:	blue
Electronics cabinet, A12:	green

- The conductor and cable shields have to be connected at the ends with the corresponding clip.

⚠CAUTION **Do not open the connector housing on the cable between the camera and the VIDEOMED DI-M (D8.X1) under any circumstances.**

- Do not shorten the harness.
- Whenever possible, avoid overlapping or looping harnesses in the system and particularly in the cabinets. Do not store excess cable lengths in the cabinets (EMC) reasons).
- Be careful that the cable harnesses do not get caught in the swing-out frames.
- Water hoses 5 and 8 may only be shortened by max. 5 m.

⚠CAUTION **Do not step on the hoses. Avoid small loops and kinks as this may damage them.**

Connections and cable locations in the A12 electronics cabinet

(green cable harnesses)

- Attach the 3 cable harnesses (green) with the cable clip to the rail that is installed at the bottom of the electronics cabinet.

right - cable harness,green, from operat. console
center - cable harness,green, from unit (K3, K4....)
left - cable harness, green, from unit (K8, K9....)

- Secure the braided shield of the zipper hoses to the locations provided.
- Route the cables in the A12 electronics cabinet as shown in the adjacent Fig. 2 and connect them according to tables 1 and 3.
  The numbers or letters (e.g. (4)) are located in the cable lists on the following pages.
- Prior to routing the system cables, remove the EMC shielding plate at N11 D11.

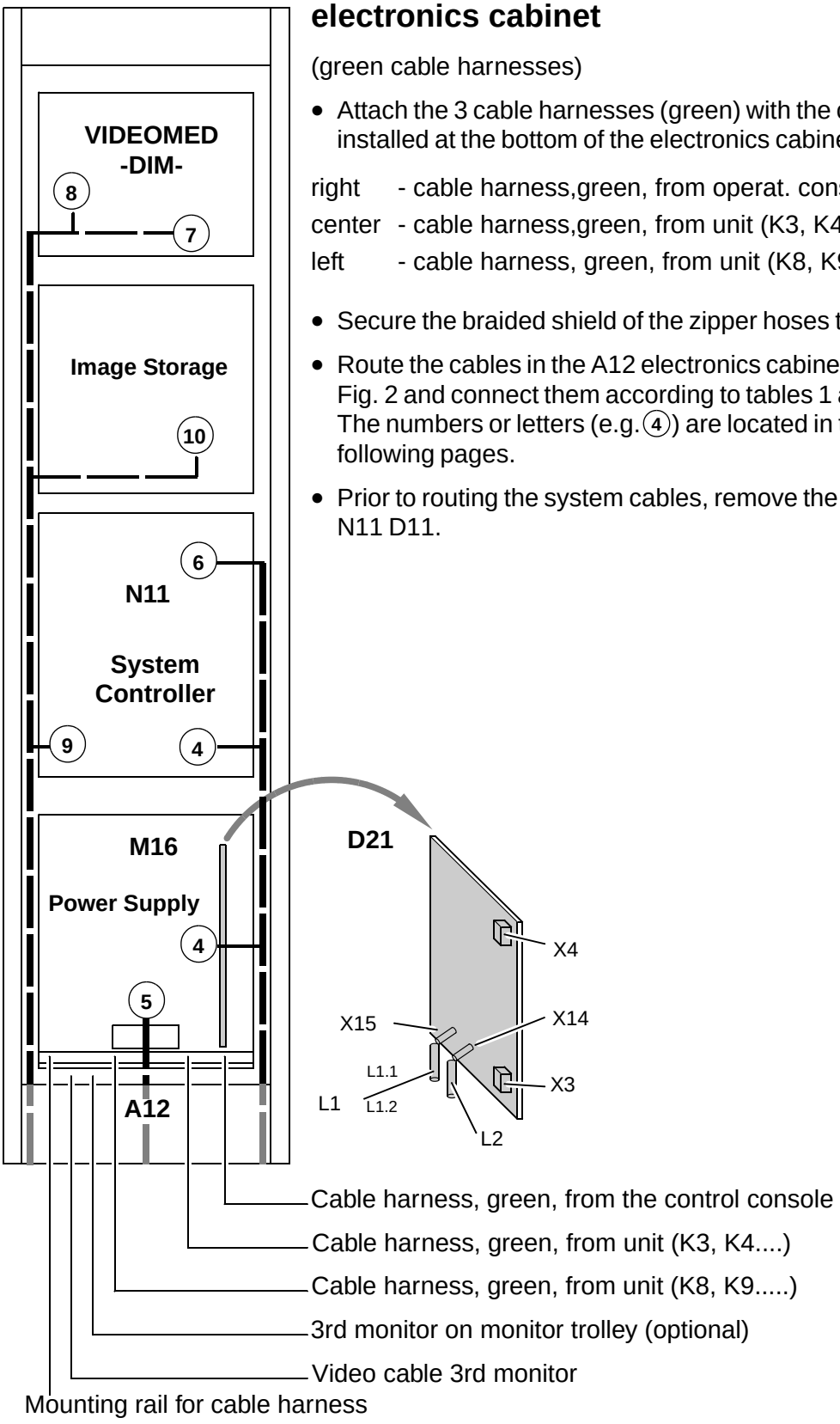
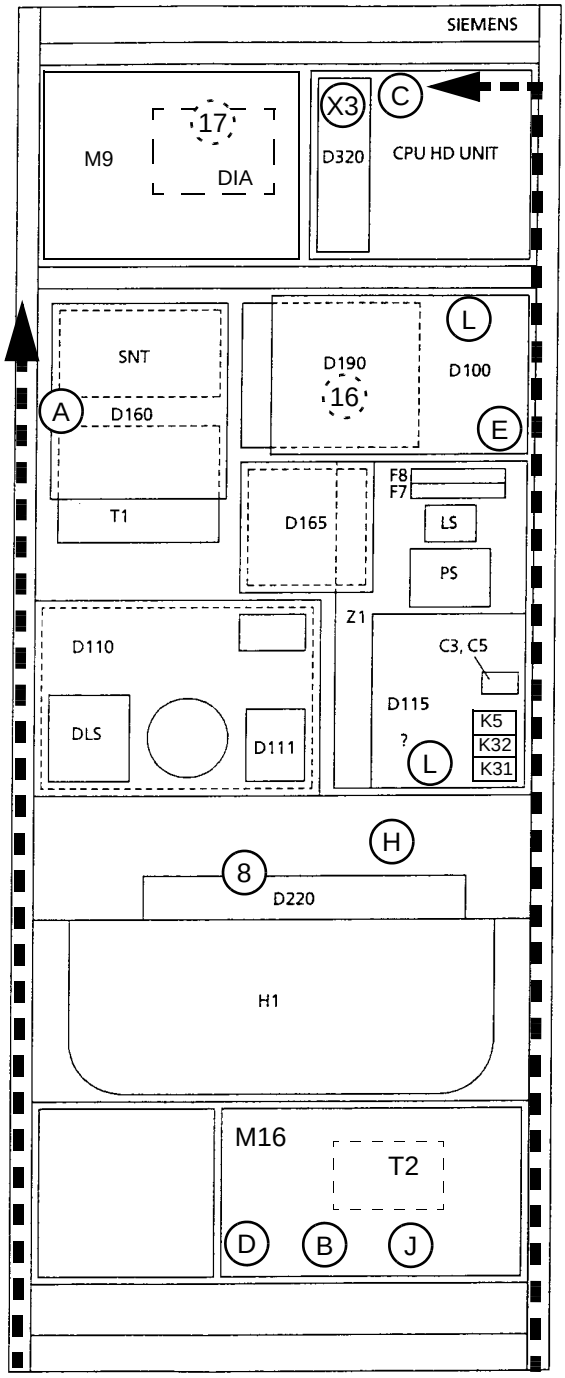


Fig. 2

Overview of cable run in the power cabinet



Route the cable in the power cabinet from the left or right only.

Fig. 3

Connections/harness locations in the generator cabinet (Part A)

- Route the harnesses in the generator cabinet as shown in Fig. 3 above, and connect them as indicated in Tables 1 and 2:

Multiline power line connections (D)

- Connect the power cables for the Multiline in M16 ((B)/Fig. 3) (refer also to the Multiline circuit diagram J1042-10):
  Connection to contactor K4
  L1 →T1
  L2 →T2
  L3 →T3
  N →K30.N
  PE →Bolt on M16
- Strain-relieve the power harness.(shielding under the clamp)

AC Generator - A12 Electronics Cabinet - A13 Shock Wave Cabinet Connections					
Type cable/ connection	**Function**	**Generator AC**	**A12 Cabinet**	**A13 Cabinet**	**ok**
4 x 4 mm^2 + Gnd, shielded	MULTILINE power supply	M16, ⏚ (B) L1, L2, L3, N	M16.X1 ⏚, N (5) F7, F8, F9		
1 x 6 mm^2	Protective conductor	M16.k30, ⏚ (D)	M16, ⏚ (5)		
9 pole Canon	XCS	D 320.X3 (C)	VDIM.D5.X13 (7)		
9 pole Canon	Act. value interface	D100.X200 (E)	N11.D6.X8 (6)		
3 x 1,5 mm^2, shielded	A13 Power supply		M16.X2. (5) L3, N, PE	N12.X1. (2) L, N, PE 1)	
1 x 6 mm^2	Protective conductor		M16, ⏚ (5)	base ⏚ 1) (2)	
Canon	Controller		N11.D11.k104 (4)	N12.k104 1) (2)	

Tab. 1

1) Connections and cable position in the cabinet A13, refer to the fig. on page 3-11.

System Operating Console - Generator Connections This cable is located in the “System operating console-Electronics Cabinet” zipper hose					
Type of cable/ connector	**Function**	**In Control Console**	**in AC Generator**		**ok**
15 pole, Canon	System ON/OFF	Door	D160.X9		

Tab. 2

Connecting the XCS harnesses Ⓒ and Ⓔ

- Pull the **XCS** harnesses (coming from the electronics cabinet) on the **right** side into the frame of the power cabinet, guide them up and connect them on boards D100.X200 Ⓔ and D320.X3 Ⓒ per their designations (Fig. 3).
- Strain-relieve the harnesses using cable ties.

Control console connections

- Plug in the control console harnesses on board D160.X9 as shown in Table 2 (Ⓐ /Fig. 3).
- Strain-relieve the harnesses on the side using cable ties.

Power and voltage supply connection, protective ground wire connection in A12				
Type of cable/connection	**Function**	**Device / operating console**	**Cabinet A12**	**ok**
1 x 16 mm^2 Cable harness in the middle	Protective conductor	device PE	M16.PE ⑤	
3 x 1.5 mm^2, shielded cable harness in the middle	Power connection Z96	device X11.1, 2, 3	M16.X2 ⑤ L1, N, PE	
4 x 2.5 mm^2, shielded cable harness in the middle	Voltage supply of the output stages	device K1	M16/D21. ④ X14, L1.2	
3 x 1.5 mm^2, shielded cable on the right	Power connection control console	socket operating console	M16.X2 ⑤ L2, N, PE	
1 x 6 mm^2 right cable harness	Protective conductor	PE operating console	M16.PE ⑤	

Tab. 3

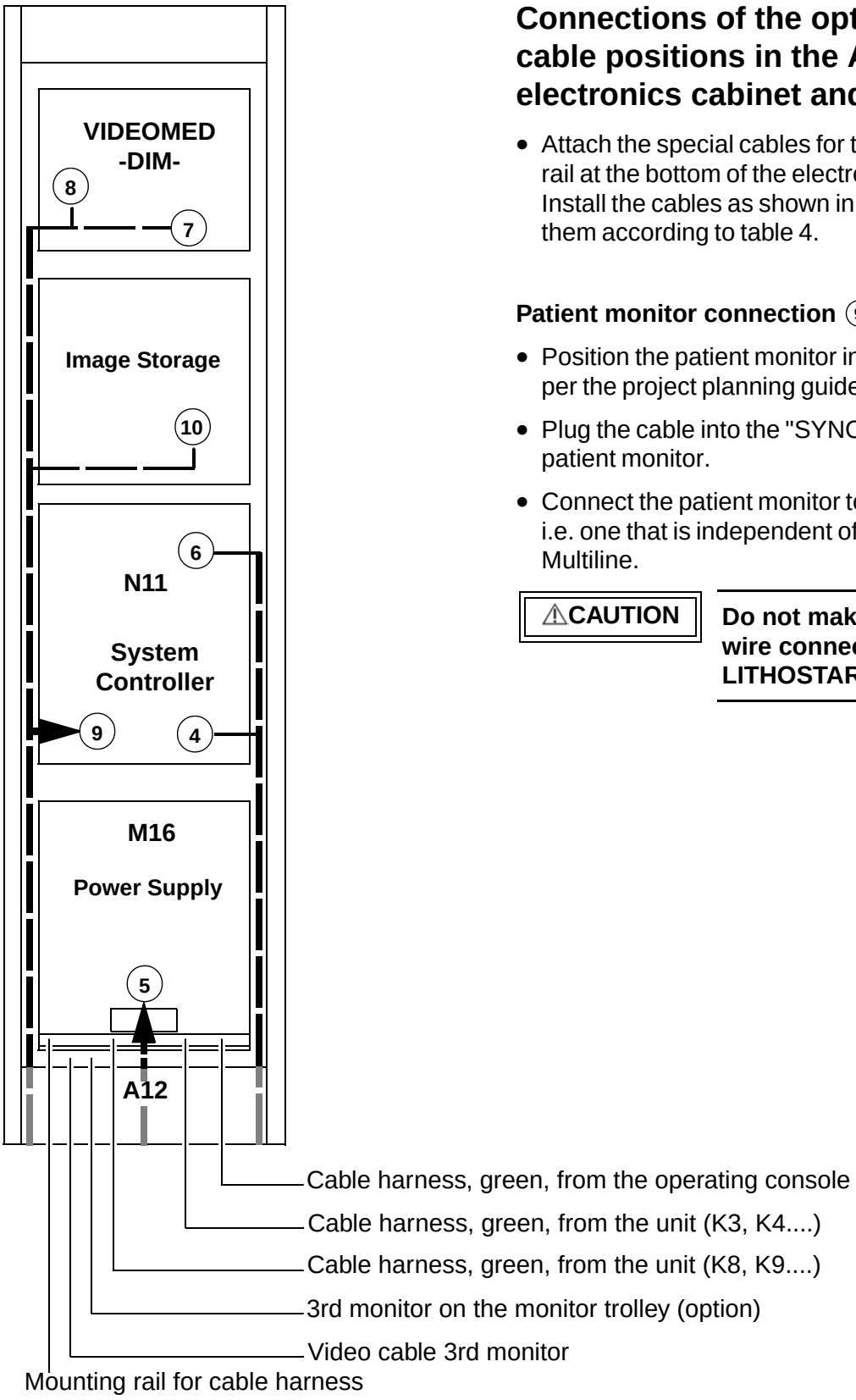


Fig. 4

Connections of the options and their cable positions in the A12 electronics cabinet and generator AC

- Attach the special cables for the 3rd monitor to the rail at the bottom of the electronics cabinet. Install the cables as shown in Fig.4 and connect them according to table 4.

Patient monitor connection (9)

- Position the patient monitor in the location provided per the project planning guide (e.g. ceiling support).
- Plug the cable into the "SYNC" connector of the patient monitor.
- Connect the patient monitor to its own power supply, i.e. one that is independent of the LITHOSTAR Multiline.

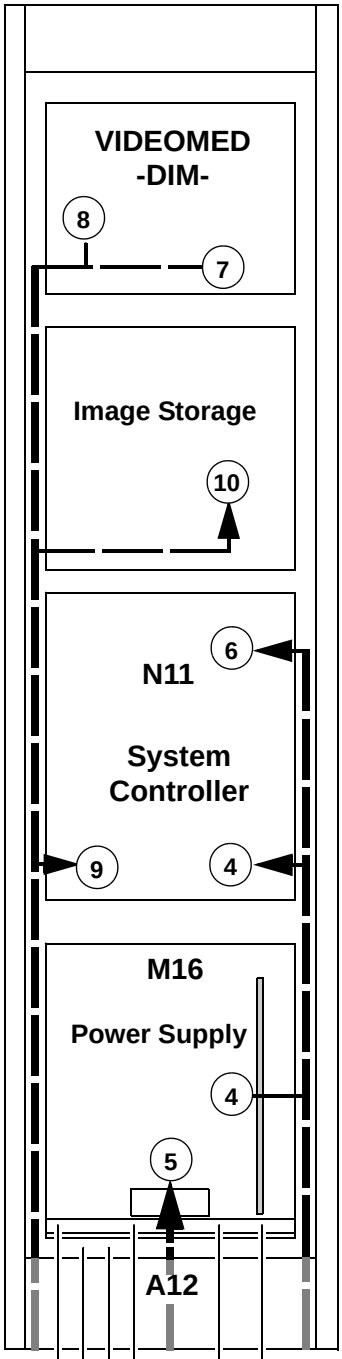
⚠CAUTION

Do not make any direct ground wire connections to the LITHOSTAR.

Connections for the Options in the A12 Electronic Cabinet or in the AC Generator				
Type of cable / connector	**Function**	**Optional Unit**	**In the A12 Cabinet or in the AC Generator**	**ok**
3 x 1.5 mm^2	Power supply voltage	3rd Monitor * Ⓐ	A12/M16.X2.L2, N, PE ⑤	
1 x 4 mm^2	Protective conductor	Monitor trolley	A12/M16 ⏚ ⑤	
Coax cable	Video	Monitor trolley	A12/Monitor 3_{in}	
	Radiation display	Monitor trolley	AC/D160.X61 refer to generator wiring diagram X2206-11	
K14	ECG control	Patient monitor "SYNC"	A12/N11/D11.k14 ⑨	

Tab. 4

* Ⓐ The monitor cable contains more cable than necessary for connecting the LITHOSTAR Multiline. Roll up the additional cables and place them in the control cabinet.



Cable harness, green, from the control console

Cable harness, green, from the unit (K3, K4....)

Cable harness, green, from the unit (K8, K9....)

3rd monitor on the monitor trolley (option)

Video cable 3rd monitor

Mounting rail for cable harness

Fig. 5

Connections and cable locations in the A12 electronics cabinet and in the control console

(cable harness, green)

- Route the cables in the A12 electronics cabinet, as shown in Fig.5 and connect them as shown in Table 5, 6 and 7.

VIDEOMED connection: (8)

- Remove the XCS cables X11 and X12 from the D5 board.
- Remove the EMC shielding on the Videomed.
- Route the camera connector D8.X1similar to the video cable underneath the rack and connect it to the backplane as shown in Table 5.
  Remove board D1 for this purpose.
- Attach the cable with a cable clip to the rack above the shield.
- Attach the EMC shielding.
- Reinstall the XCS cables X11 and X12 on the D5 board.

Unit - A12 Electronic Cabinet Connections (left Cable Harness, green)				
Type of cable / connector	**Function**	**In Unit**	**In Cabinet**	**ok**
12 pole connector, k8	Motor controller I	D32.X54	N11/D11.K8 ⑨	
12 pole connector, k9	Motor controller II	D32.X55	N11/D11.K9 **3)** ⑨	
Special connector	Control and Power supply for the collimator	Collimator, Z66.X1	N11/D6.X3 ⑥ M16/D21.X4 ④	
Special	Camera	Camera, D115.X2	VIDEOMED DI-M ⑧ D8.X1 on the back- **4)** plane	
Special	Dose measurement chamber (optional)	Measurement chamber collimator	Diamentor (Control console)	

Tab. 5

3) Remove the EMC shielding plate on the D6 board
Insert the cable
Reattach the EMC shielding plate and make sure that the cable is in the recess of the EMC cover.

4) After connecting the D8.X1, reinstall the EMI shielding plate.
(Refer also to VIDEOMED connection in chapter 4, page 8.)

Unit - A12 Electronics Cabinet Connections (center Cable Harness, green)					
Type of cable / connector		**Function**	**In Unit**	**In Cabinet**	**ok**
4 pole connector	k7	Power supply for the magnetic brakes	D31.X34	M16/D21.X3 ④	
37 pole connector	k3	Incremental sensor	D31.X30	N11/D11.K3 ④	
37 pole connector	k4	Actual values	D31.X31	N11/D11.K4 ④	
37 pole connector	k5	Switches and DÜP	D31.X32	N11/D11.K5 ④	
50 pole connector	k6	Motor and magnetic brake control	D31.X33	N11/D11.K6 ④	
9 pole connector	k12	Zoom selection		N11/D11.K12 ④	
9 pole connector	k13	Respirator sensor connection	D27.X1	N11/D11.K13 ⑨	

Tab. 6

System Control Console - Electronics Cabinet Connections (right Cable Harness, green)				
Type of cable / connection	**Function**	**In Control Console**	**In A12 Cabinet**	**ok**
25 pole, Canon	Controller	Slide-out shelf	N11/D11.K11 ④	
9 pole, Canon	4 channel ECG - monitor	4 channel ECG - monitor	N11/D11.K103A ⑨	
Coax video cable	Video input Monitor 1_{in}	1st Video monitor Monitor 1_{in}	MEMOSKOP,X11 8) ⑩	
Coax video cable	Video input Monitor 2_{in}	2nd Video monitor Monitor 2_{in}	MEMOSKOP,X12 8) ⑩	
Coax video cable	Video connection Monitor 1 ⇒Monitor 3	3rd Video monitor 9) 7) Monitor 1_{out} Monitor 3_{in}	o to 3rd monitor if configured ⑩ 10)	
Coax video cable	Hardcopy input	MULTISPOT 9)	MEMOSKOP, X10 8) ⑩	
9 pole, Canon	Hardcopy control	MULTISPOT 9)	MEMOSKOP, X4 8) ⑩	

Tab. 7

connect to the monitor, only if a third monitor is present. **7)**

Options **9)**

The coaxial cable should be attached with a cable clip to the rail in the electronics cabinet A12. Electrically isolate the coaxial plug from the rack of the cabinet. **10)**

- Check the switch positions on the back of the monitors and ensure that the setting is as follows:
  - Video signal to 0.3 V.
  - If no third monitor is present, set both monitors to 75 Ohms.
  - If a third monitor is present, set the output of the first monitor on high.
- Reattach the EMC shielding plate on the N11 D11. Make sure that all the cables are in the recesses and will not get damaged when reattaching the shielding plate.
- After connecting the MEMOSKOP cabling, reinstall the MEMOSKOP cover panel. **8)** The cable shielding must be under the corresponding clamp.

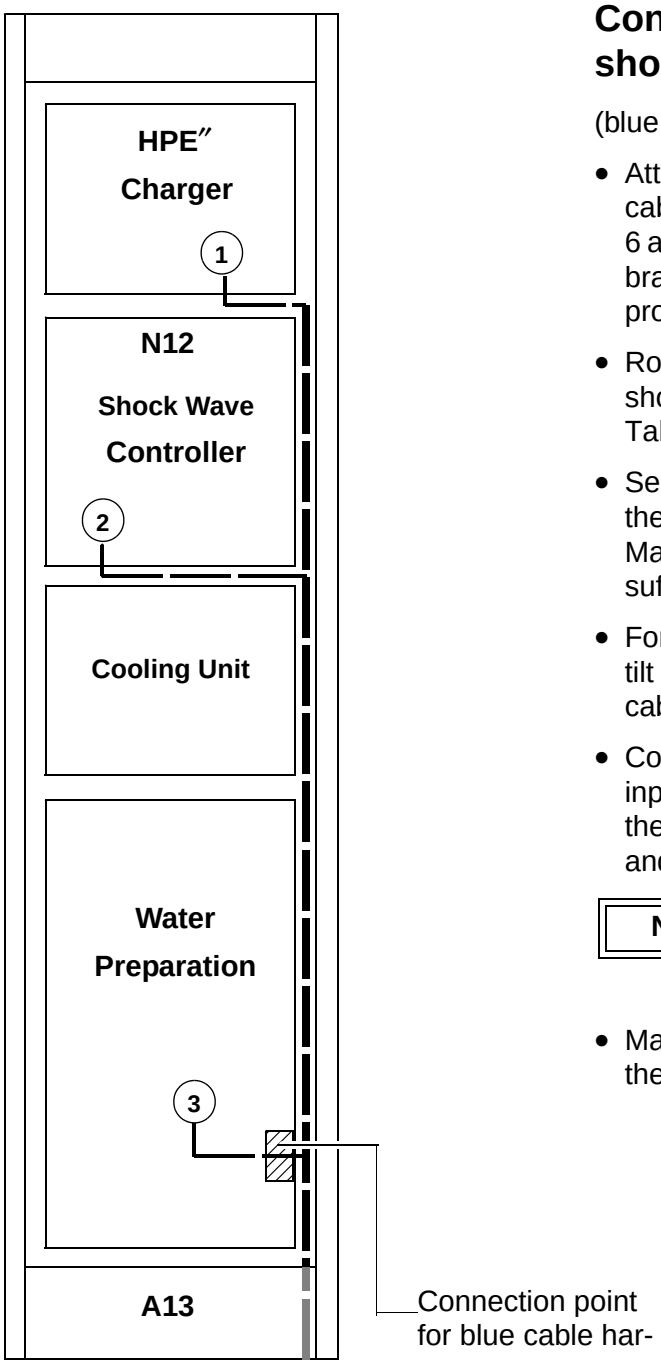


Fig. 6

Connections/cable locations in the A13 shock wave cabinet

(blue cable harness)

- Attach the blue cable harness in the shock wave cabinet A13 on the front and rear cabinet rack at pos. 6 and 7. with cable clips. Refer to Fig. 6. Attach the braided shield of the zipper hose on the plate provided at pos. 8/9.
- Route the cables for the A13 shock wave cabinet as shown in the Fig. left and connect them as shown in Table 8.
- Secure the cables leading to N12 with cable ties on the right side of position 50/52.
  Make sure the conductors to D19 and D91 are sufficiently long.
- For connecting the cables to the charger, you have to tilt M12 toward the front. Use cable ties to secure the cables on the right side of position 67/68.
- Connect the hoses for the **water connections** at the input/output point (3) in the shock wave cabinet per their designations or as shown in connection Table 8 and secure them with hose clamps.

NOTICE	**The hoses must not be shortened by more than 5 m, if required**

- Make sure there are no kinks in the hoses and that they are secured.

Connection, Unit - A13 Shock Wave Control Cabinet (blue cable harness)				
Type of cable / connector	**Function**	**In Unit**	**In Cabinet**	**ok**
Special	Trigger lead	X2, Power unit	N12.X2 ②	
"	Test lead U/2	X5, Power unit	N12.D91.X2 5) ②	
"	Test lead $U_{meß}$	X4, Power unit	N12.D91.X2 5) ②	
"	Test lead $I_{meß}$	X3, Power unit	N12.D91.X3 5) ②	
EK20 special	Fan power supply	X40, Power unit	N12.K4 ②	
EK20 special	Coupling	X12, coupling assembly	N12.K5 ②	
9 pole, Canon	Coding	X13, Power unit	N12.K103 ②	
9 pole, Canon	Shock head sensors	X11, Shock wave head	N12.K101 ②	
9 pole, Canon	Coding	Shock wave head	N12.K102 ②	
Special	K26 charger lead	X1, Power unit	Charger 6) ①	
1 x 4 mm^2	Protective conductor	⏚ Power unit	PE, Charger 6) ①	
Type of hose				
Water	Cooling system intake	Shock wave head	5 Exchanger ③	
Water	Cooling system return	Shock wave head	8 Exchanger ③	

Tab. 8

5) Allow enough cable length so that the boards can be unplugged with the cables still connected.

6) - To connect these cables, swing the N12 out towards the front.

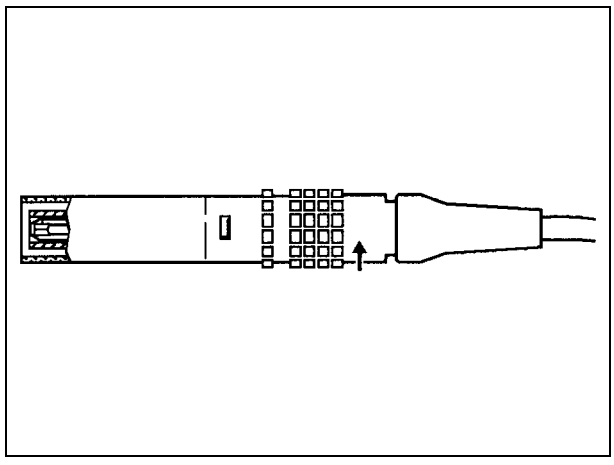
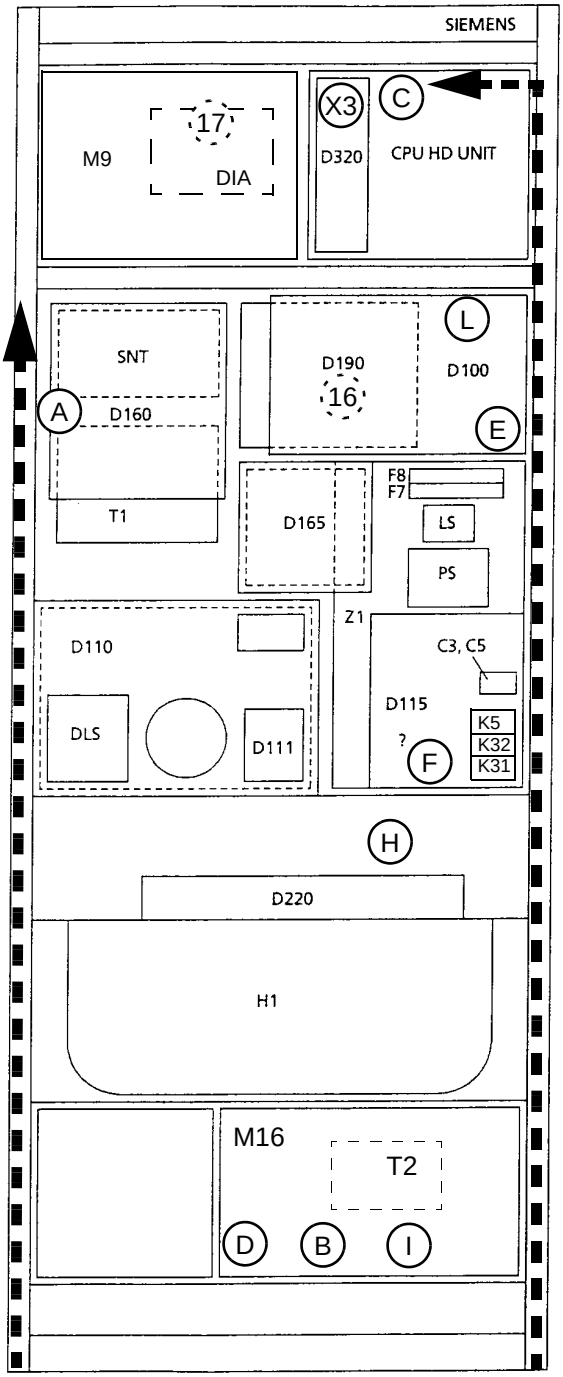


Fig. 7

- Check that the screw connections of the high voltage connector K26 are tightened securely (refer to Fig. 7 on the left)
- Insert the connector of high voltage cable K26 on the bottom of the charger until it locks audibly into position.
- The jumper between ⏚ and 0V must be present.

Overview of cable run in the power cabinet



Route the cable in the power cabinet from the left or right only.

Fig. 8

Connections/cable locations in the generator cabinet

- Route the cables in the generator cabinet as shown in Fig. 8 above, and connect them in accordance with Table 9:
- Install the yellow cable harness in the generator cabinet below M16. Connect the shielding of the zipper hose to the ⏚ bolt in the M16 (Ⓓ /Fig. 8).
  Strain-relieve the zipper hose.

Rotating anode cable connection

- Guide the rotating anode cable (internally required length approx. 1 m) up along the right side in the frame of the generator cabinet to the anode starter (Ⓕ /Fig. 8).
- Connect the braided shielding (external shielding) of the end of the lead to the right side of the anode starter under one of the clamps (Ⓕ /Fig. or 1/Fig. 9).
- Connect the rotating anode cable to the K3 breaker of the anode starter (Ⓕ /Fig. 8):

On breaker, contact:	K31/R2	K31/R4	K32/R2
Anode cable leads:	I / 1	0	II / 2

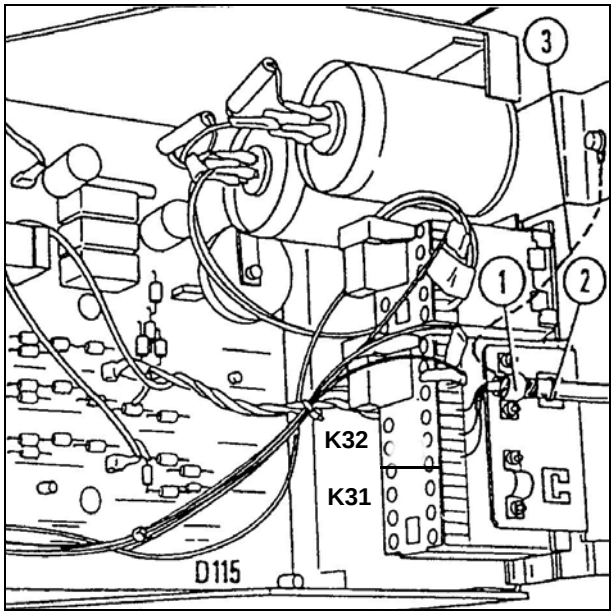


Fig. 9

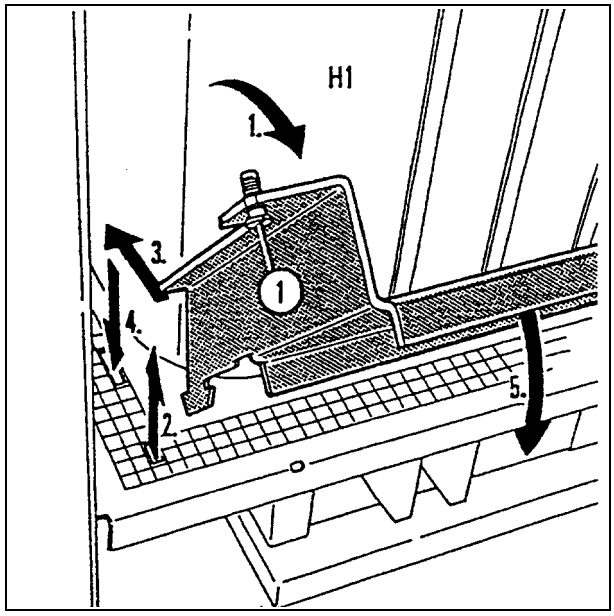


Fig. 10

Generator - Unit Connections (Yellow Cable Harness)					
Type of Cable	**Function**	**Generator**		**System**	**ok**
Stator cable 3 x 0.75 mm^2	Rotating anode drive	Anode starter K31.R2, R4, K32.R2	Ⓕ	X-ray tube I, 0, II	
2 x HSK	HV power supply	HV-Transf. H1.API	Ⓗ	X-ray tube	
1 x 6 mm^2	Protective conductor	⏚ - bolts (on M16 under K20)		X-ray tube	
3 x 0.25 mm^2	Oil pressure switch	D160.x6.1 3 and 4		X-ray tube	
Iontomat cable	SDM connection	D100.X28	Ⓛ	I.I. bracket D100.X1	

Tab. 9

Connecting the H1 High Voltage Transformer

- Remove the inverter cover and open the bayonet connectors (1/Fig. 10).
- Change the position of the transformer mount (Fig. 10) and swing it out.
- Place the high voltage transformer on the transformer mount.
- Route the high voltage harnesses up to the high voltage transformer (Pfeil/Fig. 11).
- Check the oil level in the high voltage receptacles (approximately 1 cm); if necessary, refill with oil (part no. 44 10 023 RV090 1 liter).
- Insert the high voltage plug without silicone disk but with silicone gasket into the correct receptacle of H1 (Workstation 1).
- Slide the H1 high voltage transformer into the generator cabinet.

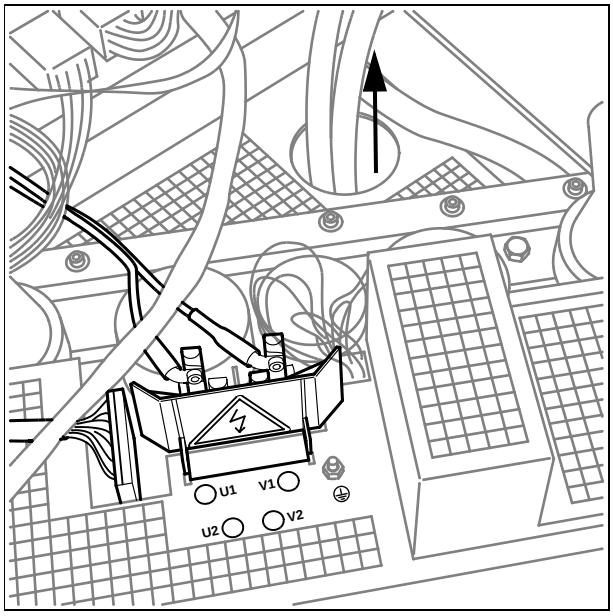


Fig. 11

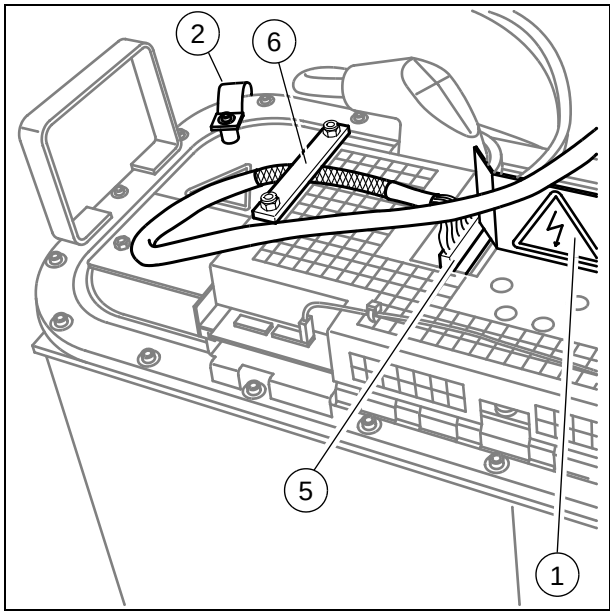


Fig. 12

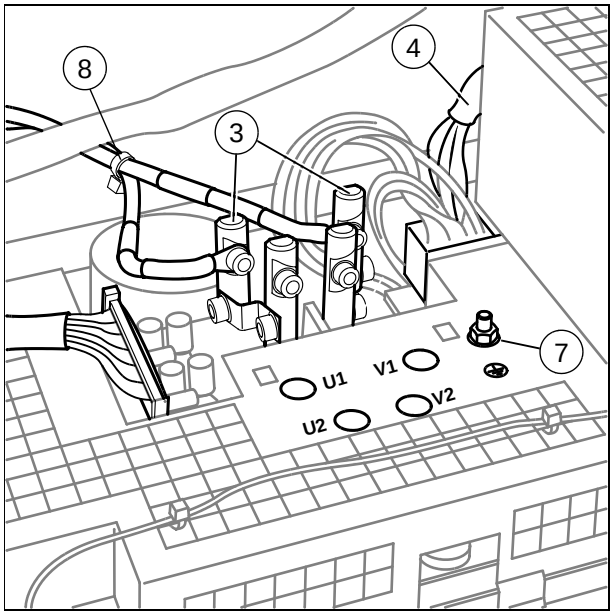


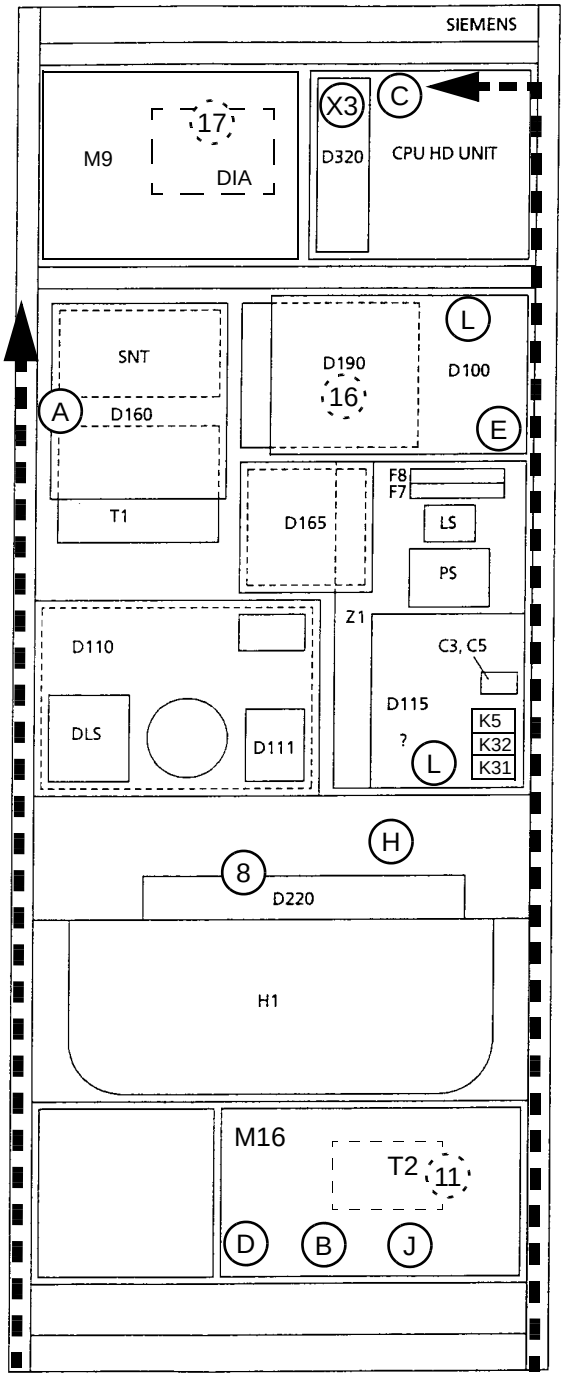
Fig. 13

NOTICE **There must be a ground connection between the cover and ground.**

- Change the position of the transformer mount (Fig.10), lift it, and snap in the bayonet connectors (1/Fig. 10) of the mount.
- Use cable ties to strain-relieve the cables (8/Fig. 13).
- Carefully remove the plastic guard plate for board D220 with ϟ symbols (1/Fig. 12).

- Connect the protective conductor cable to H1. ⏚ (2/Fig. 12).
- Thread the (primary) leads H1.U1 and H1.V1 of the inverter module per the designation onto H1 (3/Fig. 13).
- Route the cable connected to D220.X41 (4/Fig. 13) to board D160 and connect it to plug X44.
- Plug the cable X1 from board D100 to connector X1 on board D220 (5/Fig. 12) and strain-relieve it on the cover (shielding underneath the strain relief (6/Fig. 12)).
- Reinstall the guard with the ϟ symbols (1/Fig. 12).
- Check the nuts on the protective conductor studs (7/Fig. 13) and tighten them, if necessary.

Overview of cable run in the power cabinet



Route the cable in the power cabinet from the left or right only.

Fig. 14

Connections/harness locations in the generator cabinet (Part C)

- Route the harnesses in the generator cabinet as shown in Fig. 13 above, and connect them in accordance with Table 10:

Generator power line connection (J)

Nominal Line Voltage: 400 V ± 10%

- Secure the screw type terminals from the service packet to the conductors of the power cable. If the power cable diameter is small enough, turn the clamps 180° (both curvatures opposite to each other).
- Apply end splices to the power cable.
- Connect power leads L1, L2, L3, N, PE (connection (J)/Fig. 13) to terminal strip K20.
- Strain-relieve the power cable. Existing shielding should not be connected.

Generator - Periphery						
Type of Cable	**Function**		**Generator**			**ok**
Power line cable 3/N/Gnd	System power line connection		M16. K20 (J)		Main distributor L1, L2, L3, N, ⏚	
2 x 0.75 mm^2	Radiation protection	9)	M16.D160.X61 (A)		Door contact	
2 x 0.75 mm^2	Radiation buzzer Radiation display	9)	M16.D160.X61 (A)		X-ray display lamps	

Tab. 10

9) option

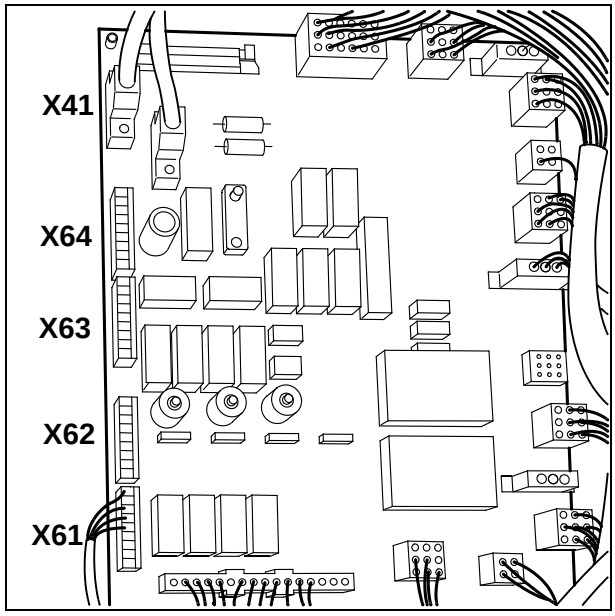


Fig. 15

Monitoring devices and indicators for radiation protection

At the customer's request or when country-specific regulations require (e.g. DHHS), the following monitoring devices and indicators can be connected in the POLYDOROS SX to D160.X61 to 64 (1/Fig. 15):

- **Connection of the door contact for blocking radiation**

  After removing the associated jumper, connect the door contact

  for **AP1** to: D160.X61.**3** and D160.X61.**4**

- **Connection of the indicator lamps for tube assembly selection**

  Attach an indicator lamp in the vicinity of the tube assembly (24 V ~, max. 5 W) so that it is clearly visible from the control console.

  Connect the lamp

  for **AP1** to: D160.X61.**5** 24 V ~and D160.X61.**6** (0 V_L)

- **Connection of the radiation indicator lamps (e.g. in front of the door of the examination room)**

  If an external radiation indicator is desired for fluoroscopy and exposure, connect the radiation-dependent indicator lamps (24 V ~, max. 5 W) as follows to board D160:

Indication with ZB:	jumper X38.**1-2** on D160 plugged in
Indication with radiation only:	jumper X38.**1-2** on D160 pulled out

  Connect the radiation indicator lamps for separate rooms

  for **AP1** to: D160.X61.**7** 24 V ~and D160.X61.**8** (0 V_L)

  Connect general radiation indicator lamp

  for AP1

  D160.X64.**8** 24 V ~ and D160.X64.**7** (0 V_L).

Connect the temperature monitoring devices and oil pressure switches.

NOTICE	**If a temperature switch is present, connect this in series with the oil pressure switch.**

- **Room lighting control**

  A contactor for the room lighting control can be connected to board D160. To program the room lighting control, refer to the Start-up instructions, System configuration, RXL2-120.034...” Site Adjustments” in the section “Room light” as required.

  Connect contactor connection to:

  D160.X64.**5** (24 V ~) and D160.X64.**6** (0 V_L).

Ultrasound option

NOTICE **Unpack and assemble the SONOLINE according to the instructions.**

Type of Cable	Function	Ultrasound system	Multiline		ok
			Unit	Cabinet A12	
1 x 4 mm^2	Protective conductor	Rear panel	Protective conductor terminal		
3 x 0.75 mm^2 screened	Voltage supply	Rear panel	refer to text		
Canon 9 pole	Control cable	Local ultrasound tableside control	D31.X28		
Fiber optic cable	Communication	Rear panel		N11.D6	
Video		Rear panel		w/o function	

Tab. 11

For 230 V Sonoline line voltage

- Connect the cables to the power line terminal NK 1, 2, 3 (Fig. 16)
- Shielding see A/Fig. 16

For 115 V Sonoline line voltage

(the required parts are located in the 115 V power supply packet)

- Attach the supplied grounded instrument connector (female connector) and the nozzle to the 115 V power supply cable routed into the base frame by the customer.
- Connect the grounded instrument connector (male connector) and the nozzle to the power line cable from the corrugated hose.
- Plug the two grounded instrument connectors together (corrugated hose - power supplies).

- Connect the protective ground lead to the clamp (Fig. 16).
- Connect the control cable to D31.X28 (Fig. 16). This is possible only after moving the system.
- Route the fiber optic and video cable to the control cabinet.
  (Adhere to the installation instructions for fiber optic cables /module RX0-000.038.02...).
- Route the video cable into the control cabinet (not used).
- Connect the ultrasound tableside control to SONOLINE.
- Connect the ultrasound probe and place the probe in its holder.
- Move board D6 slightly away from N11 to facilitate this.
- Plug the fiber optic cable into N11 on board D6 (according to color code).
- Connect the corrugated hose to the Sonoline.

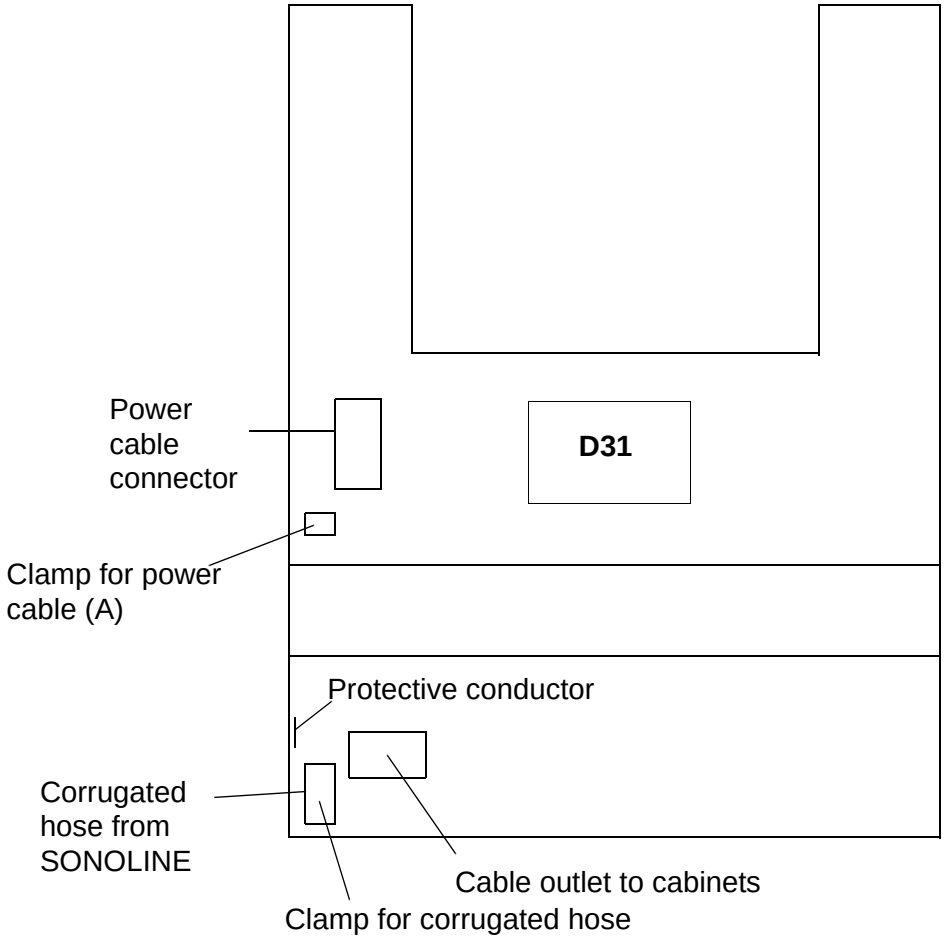

Power
cable
connector
D31
Clamp for power
cable (A)
Protective conductor
Corrugated
hose from
SONOLINE
Cable outlet to cabinets
Clamp for corrugated hose

Fig. 16

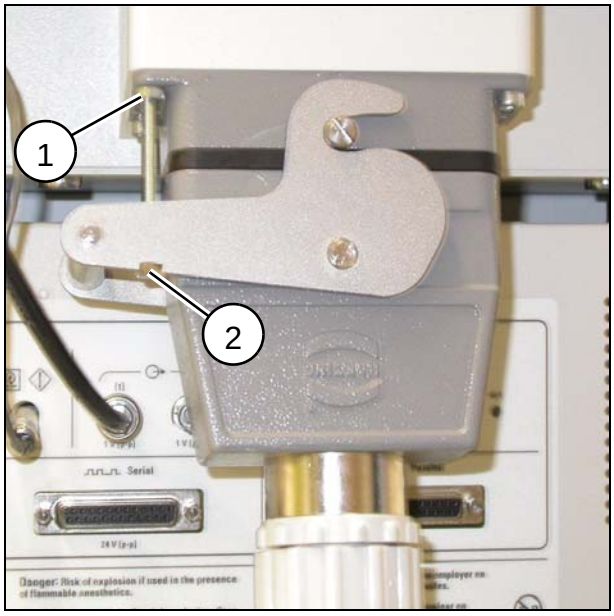


Fig. 17

Fastening of plug, Sonoline

- Remove the existing screw at point (1/Fig. 17).
- Screw in the mounting screw according to Fig. 17. The clamp (2/Fig. 17) prevents loosening the plug connection without tools.
- Tighten the counternut (1/Fig. 17).

NOTE	**CE approval is valid for the entire system only. If the ultrasound unit is removed, then this does not retain the required CE approval.**

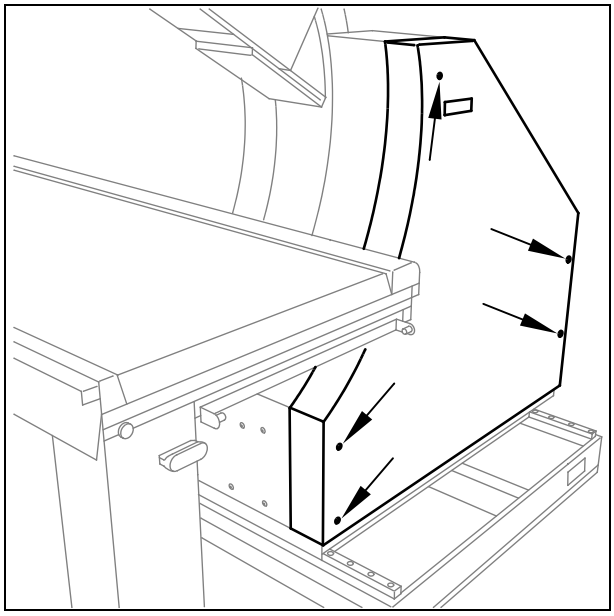


Fig. 1

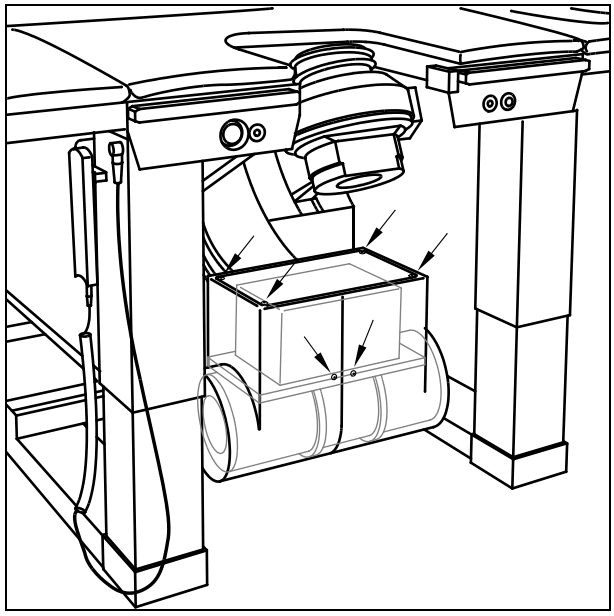


Fig. 2

Attaching the remaining panels

Installation of the remaining panels is described here as part of the unit installation. However, to prevent double work, this should be done after start-up has been completed as described in the Start-up Instructions, RXL2-120.034...

- Install the two large plastic panel sections on the side of the unit and mount them in place (↘/Fig. 1); to do this, temporarily loosen the two screws on the beveled surfaces of the rear cover panel.
- Install the X-ray tube housing and attach them together (↘/Fig. 2).
- Secure the EMC metal shielding with screws to the designated location.
- Close all front walls of the cabinets.

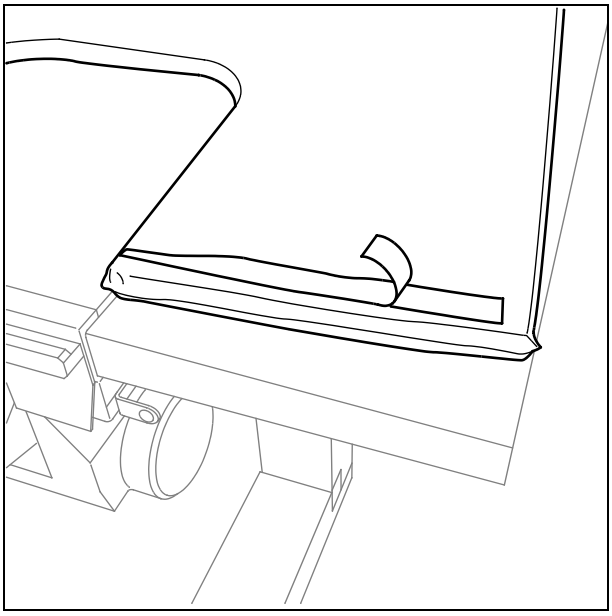


Fig. 3

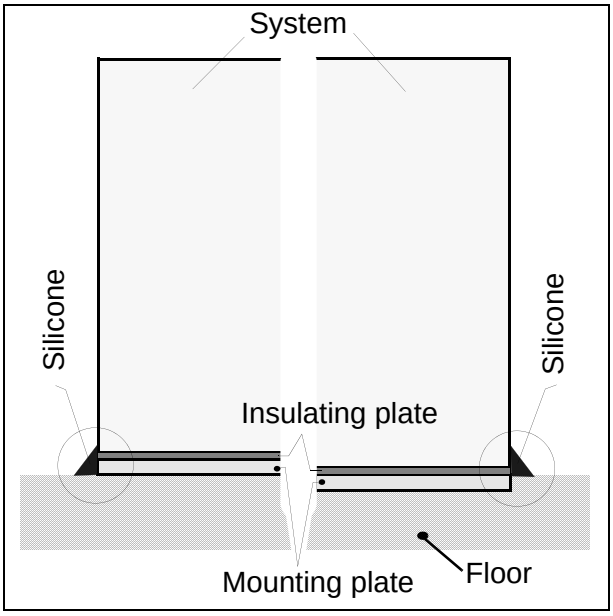


Fig. 4

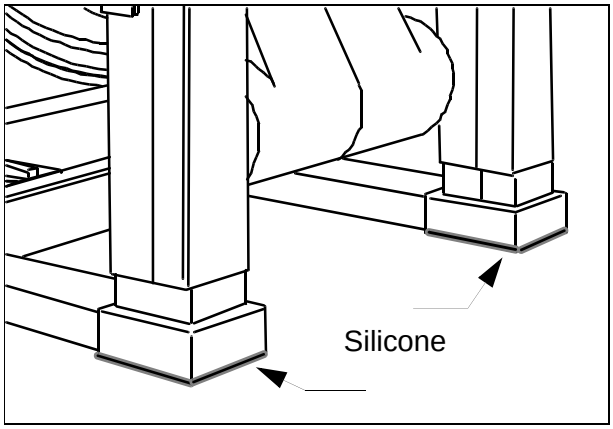


Fig. 5

- Remove all the protective plastic foil from the various operating panels.
- Attach all the cabinet front panels.
- Seal all seams between the system and the floor with silicone suitable for wet cells (Fig. 4 and Fig. 5).
- Complete the installation protocol in register 3 of the log book.

Adapting the Other Accessories

- Perform a test installation of all accessories that have been included in the shipment in accordance with the Operating Instructions

Chap. 0	Cover, Contents, Revision newly generated.
Chap. 4 - 24	Page new added.
Chap. 3 - 20	Page new added.

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